

Multidisciplinary residential home intervention to improve outcomes for frail residents

Anna Steel (✉ annasteel@nhs.net)

Barnet Hospital <https://orcid.org/0000-0001-9802-3603>

Helen Hopwood

Barnet Enfield and Haringey Mental Health NHS Trust

Elizabeth Goodwin

Brunswick Park Medical Centre

Elizabeth L Sampson

Marie Curie Palliative Care Research Department, Division of Psychiatry, University College London

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Abstract

Background

Residential homes provide accommodation and assistance with personal care only and are not required to have registered nurses on site. However, their residents often have a combination of comorbidity, polypharmacy, frailty and mental-health conditions with poor access to healthcare to meet these needs. Integrated healthcare for older people is a key NHS priority in the Long-Term Plan and the Five-Year Forward View. We describe development and implementation of multi-disciplinary intervention to integrate healthcare and promote interprofessional education.

Methods

A multi-disciplinary residential home quality improvement project in two cycles by a team comprising senior and trainee general practitioners, trainees in geriatrics, psychiatry, pharmacist and residential home senior staff. The intervention was underpinned by the framework for enhanced health in care homes including Comprehensive Geriatric Assessment (CGA) and mental-health review. Each intervention session included an educational presentation by a team member consideration of each resident in a pre-evaluation multi-disciplinary discussion followed by a structured clinical assessment and discussion of proposed management.

Results

Three residential homes participated with a total 34 residents receiving intervention. In one residential home, there was a 75% reduction in admissions for those reviewed and a reduction in overall admission costs. Polypharmacy was reduced by an average of 2 medications per resident across the three sites. There was a 63% increase in cardio-pulmonary resuscitation decisions and 76% increase in advance care planning discussions.

Conclusion

This was an effective model for multi-disciplinary trainees working with a perceived impact on physical and mental health, and valuable opportunities for sharing learning.

Background

Approximately 420 000 older people live in care homes in England [1]. “Care homes” is a generic term; within the UK there are “care homes with nursing” and “residential homes” (RHs) providing accommodation and support with activities of daily living, but without on-site nurses. Resident needs in both nursing and RHs are complex, with a combination of physical frailty and mental health conditions [2].

Care home residents have 40–50% more emergency admissions and fewer outpatient appointments than the general population of the same age [3]. Many avoidable admissions are driven by unsatisfactory provision of healthcare services [4, 5] with medication errors occurring in approximately 70% of residents [6]. The majority of care home residents are in their last years of life [3] but may not receive adequate end-of-life care or advance care planning (ACP) [7]. This is especially challenging for the 80% of the care home population with dementia [8].

Enhanced Health in Care Homes (EHCH) is a cornerstone of the NHS Long Term Plan [9]. Integrated care between primary, secondary and community providers, is effective and can lower rates of emergency bed use. [3, 10]. Multi-disciplinary teams (MDTs) linking community and hospital-based services increase functioning, reduce hospital costs and lengths of stay [11]. Key Recommendations from The British Geriatrics Society (BGS) Quest for Quality report include ensuring fair access to NHS services, providing a comprehensive geriatric assessment (CGA), promoting autonomy and care plans towards the end-of-life [5]. Despite many “top down” policy drivers, implementing change in practice is challenging and a more “bottom-up” context-specific approach such as local quality improvement may deliver more pragmatic and sustainable change [12].

RHs have higher ambulance call and emergency admission rates [13, 3] and fewer General Practitioner (GP) visits [14] compared to care homes with nursing thus our focus on RHs for this project.

We aimed to improve multi-disciplinary care in RHs focusing on key elements derived from current policy; CGA, medication optimisation, end-of-life care planning and education.

Methods

We conducted a multi-disciplinary RH quality improvement project in two cycles. The first cycle was a pilot, subsequently rolled out to another location. Cycle one was conducted between 20/09/2017-14/02/2018 and cycle two between 21/03/2018-12/08/2018.

Context

The project was set within three urban RHs in North London. The first cycle was conducted in RHs 1 and 2 and the second cycle in RH3. The general practice supporting homes 1 and 2 had five GP partners and two salaried GPs looking after 10 500 patients, 125 of whom were in three different RHs. The GP supporting RH3 worked in a practice with two partners, four salaried GPs and 9000 patients, 40 of whom resided in one RH. We collected data on RH characteristics; location, type of care, number of nurses, number of beds, Care Quality Commission (CQC) rating,

Intervention team

Cycle one: The team included a GP lead, senior trainees from GP (one), psychiatry (one) and geriatrics (two), a primary-care pharmacist, the RH manager (homes 1 and 2) and deputy manager (home 1).

Cycle two: The team included a GP partner, senior trainees from GP (three), psychiatry (one) and geriatrics (three), primary-care pharmacists and the RH manager.

Intervention

The project was underpinned by the EHCH framework [15] which includes seven key standards; enhanced primary care support, multi-disciplinary support, high quality end-of-life care and dementia care, joined-up commissioning and collaboration between health and social care and workforce development. These standards informed the session design which was further adapted for cycle 2 based on the change in setting and learning from cycle 1.

Cycle 1

MDT reviews were held in the RH (Fig. 1). Residents whose physical or mental health caused concern were identified in advance and families were invited to attend. Team members obtained medical records in advance. Sessions lasted three hours. Pre-evaluation MDT discussion was followed by clinical assessment. The team divided into smaller groups to review residents according to whether there was a geriatric, psychiatric or general medical focus. The team re-convened to discuss proposed management, including medication review and identified an educational topic for the following session based on predominant issues. Following sessions, GPs made any treatment changes, organised follow-up and held resuscitation and ACP discussions with families. Psychiatric follow-up occurred where necessary.

Cycle 2

In cycle 2, to make the project trainee-led, a GP trainee took over the lead role. The team expanded to include more members ensuring there was at least one member from each discipline in each session.

Figure 1 *approximately here*

Outcomes

To assess the intervention impact, we collected data relating to the project aims; CGA, polypharmacy, end-of-life care and education. Outcome measures were reviewed following cycle 1 and some were adapted for cycle 2. To ensure data collection was complete, we had full access to all GP and RH records. We monitored the local health and social care economy for any other initiatives or changes in service provision which may have impacted our project.

Individual resident level data

We collected data on demographics (age, gender) and clinical factors (number and type of medications, physical and psychiatric comorbidities, clinical frailty scale). We documented whether participants had capacity to decide about the treatment plan,

System level data

We collected data from GP records on the number of hospital admissions from the RH (in cycle 1 admission data were collected during the project only and in cycle 2 admission data were collected in the 12 months prior, during and 12 months after the project). Costs of acute admissions for the whole RH were obtained for cycle 2 from the CCG, calculated using Healthcare Resource Groups (HRG). These are standard groupings of clinically similar treatments which use common levels of healthcare resource.

Process measures

In cycle 1, feedback from participating teams was gathered independently by an education group formed by Health Education England (HEE) and University College London Partners (UCLP). Educational sessions were assessed by documenting the topics, number of attendees, RH staff feedback via questionnaire (cycle 2 only), and participant feedback (in cycle 1 feedback was from HEE and UCLP and in cycle 2 feedback was via questionnaire). We monitored return rates of questionnaires.

Ethical considerations

This was a quality improvement project, sponsored by HEE and UCLP who are part of the Academic Health Science Networks; driving adoption and spread of innovation across healthcare. The project was led by local GPs and was an enhancement of their usual service. The implementation of the project was monitored by HEE. Staff were given the option of whether they wished to complete questionnaires or not.

Results

The RHs ranged between 21-73 beds (table 1). Tables 1 and 2 show resident demographics and outcomes.

Cycle 1

Process

A total of 13 residents were assessed across seven sessions; 5 males and 8 females, mean 82.5 years old; mean number comorbidities 8.2; mean number medications 8.6, mean clinical frailty score 6.5 (table 1). Only 1(11%) resident had capacity to decide about their treatment plans. For the remainder, plans were made in best interests.

CGA

All 13 residents had a CGA with psychiatric input and 11 (85%) had confirmed diagnosis of dementia; 7 (54%) with behavioural and psychological symptoms of dementia (BPSD) or a secondary psychiatric problem. Of those with BPSD, 4 (57%) (according to staff) or 5 (71%) (according to families) improved after intervention. Three residents had acute medical issues addressed, potentially avoiding hospital admissions; urinary tract infection, chronic obstructive pulmonary disease exacerbation and fluid overload. One resident required urgent admission. No other residents were admitted during the project's course.

Polypharmacy

Reviews resulted in an overall reduction of -0.8 medications per resident.

End of life care plans

Families were unable to attend for all but one resident. A total of 10 separate ACP discussions were held by GPs with families, triggered by the MDT. All residents were suitable for Do Not Attempt Cardio-Pulmonary Resuscitation (DNACPR) and ACP; 8 were newly initiated. ACPs are now coded as a 'significant problem' in the primary care record.

Education

A total of 7 half-hour educational sessions were delivered (Table 2).

Learning and adaptation from cycle 1

From cycle 1 we understood the value of making decisions as a team and inter-professional learning, so continued this model in cycle 2. To promote the training aspect of the project, the GP trainee was the team lead in cycle 2. Trying to cover two RHs was difficult and reduced continuity. We therefore focused on one home for cycle 2. In cycle 1 relatives were mostly unable to come to meetings so we did not set this as a priority, rather we highlighted those needing further discussion. The educational value of the sessions was more apparent after cycle 1 and so medical, pharmacy and other students were invited to attend. In cycle 1 we did not collect data on admissions pre or post project, so this was gathered in cycle 2. We also gathered data on new electronic 'Coordinate my Care' (CMC) records created following education in cycle 1.

Cycle 2

Process

A total of 21 residents were assessed in ten sessions, (11 males and 10 females, mean age 86.4 years old; mean number comorbidities 6.7; mean number of medications 7.1, mean clinical frailty score 7.3). Four (19%) patients who had capacity for medical decisions.

CGA

All 21 residents had CGA with psychiatric input and 16 (76.2%) had dementia with evidence of BPSD at review. For the residents reviewed there was a mean reduction in admissions of 0.9 per person per year (see table 2). Acute hospital admission costs for the whole home were reduced by £6025 during the year of intervention compared to the previous year.

Polypharmacy

All 21 residents had a medication review with a mean reduction of -2.1 medications per resident.

End-of-life care plans

All 21 residents had resuscitation status reviewed and ACPs were initiated or reviewed for 16 (76.2%) residents with the input from family where appropriate. An independent mental capacity advocate was needed for one resident. There were eight (38.1%) residents with a new care plan created on CMC, previously no residents had a CMC record.

Box 1: MDT feedback following cycle 2:

7 out of 9 participants answered the questionnaire with all members of the MDT finding it useful (mean rating 10/10).

The members of the MDT had different levels of experience prior to project but all strongly agreed that they had benefited from collaborative working and learning as part of an MDT.

100% the MDT members agreed or strongly agreed that their confidence in managing patients with psychological and behavioural problems, deprescribing medications and having end of life discussions had increased. 100% of participants also agreed or strongly agreed that the project had improved their understanding of primary and secondary care systems and their links between the two.

100% of the members of the MDT would recommend the project to other trainees. The feedback comments included *“useful to learn from other specialties”, “most enjoyed understanding roles and responsibilities of everyone involved in the care of a resident,” “I enjoyed bridging the gap between primary, secondary and psychiatric care”*.

Discussion

Our objective was to improve multidisciplinary care in RHs, specifically focussing on CGA, medication burden, end-of-life care planning and team education. Our detailed MDT assessment of 34 residents from three RHs reduced prescribed medications and acute hospital admissions and thus NHS costs. We increased the completion of DNACPR forms and our educational sessions received positive feedback.

CGA improves outcomes for older people in the community, hospital setting and long-term facilities [15, 16, 17] but is not routinely conducted in RHs [18].

The Proactive Healthcare of Older People in Care Homes (PEACH) protocol uses a quality improvement collaborative (QIC) intervention to improve the delivery of CGA in care homes. The intervention team comprises a GP, social care staff, nursing staff, therapists, geriatricians, voluntary staff, pharmacists, dementia specialists, care home workers/managers and members of the public [19]. Relational working between the care home and external services is key to successful healthcare delivery in this setting [20]. We implemented our model specifically in RHs to deliver CGA with input from GP, geriatricians, psychiatrist, pharmacist, RH staff/ managers and family members when available. We did not have direct access to therapists, social workers and voluntary staff but the GP liaised with these services when needed. Psychiatric input was essential; over 75% of residents had dementia and a high proportion experienced BPSD. Other initiatives have also found psychiatric support vital. In Camden and Islington the MDT has actively focused on mental wellbeing with psychology resources and activity coordinators, increasing knowledge, skills and staff support resulting in fewer admissions and shorter lengths of stay [12].

Our MDT approach resulted in fewer emergency admissions and reduced medication burden. Staff reported feeling more supported and were more proactive in bringing issues to our attention. The educational sessions were open to all staff. Our intervention may have had wider impact across the RH as there was a reduction in hospital admission costs across the whole home.

There is little literature on addressing polypharmacy in RHs where residents are particularly vulnerable to inappropriate prescribing [21]. One systematic review showed that MDT meetings, educational interventions, particularly face-to-face education improved prescribing quality [22]. Our intervention facilitated MDT discussions and educational sessions around polypharmacy. Specialist pharmaceutical input also helped to reduce medications prescribed, potentially reducing costs.

Care homes (including RHs) will become the commonest place of death over the next 20 years [23]. Education, particularly peer-training and inter-professional collaboration are potentially effective mechanisms for improving end-of-life care, although education for care home staff with a high turn-over would need to be ongoing to have a sustainable impact [24]. We dedicated 3 of 16 education sessions to end-of-life care. We had multiple discussions as an MDT around end-of-life for residents enabling the development of patient-centred care plans and improved group knowledge and experience [25]. As a result of the project one GP practice set up an ‘ACP clinic’. Within both cycles, most residents had a DNACPR form completed. In cycle 2, we used an online electronic system (Coordinate My Care) to share care plans with GPs, secondary care and the Ambulance Service.

There are limitations to the model developed. Ideally MDT participants should not change however this is inevitable when using specialist trainees who regularly rotate. The presence of the same GP lead, pharmacist and RH staff facilitated continuity. It is important when delivering CGA as part of an MDT that there is strategic collaboration between organisations providing team members, to ensure effective MDT functioning [15]. For sustainability, trainees require protected time away from regular duties. With multiple RHs, more trainees would be required, drawing resources away from secondary care. Standardised proformas to facilitate CGA would have reduced variability and improved outcome monitoring. In addition, the MDT did not include therapists or social workers who could add considerable value. Systematic processes for screening residents in need of review such as medication burden or hospital admissions, may be more effective. Reducing acute admissions shifts the burden of care onto the RH, i.e. people who die there may have previously gone to hospital, nursing home or hospice creating increased emotional burden on staff.

We only saw a proportion of residents and would need more sessions to review all. Few family members could attend but with more organisation, families could be invited earlier saving GPs time in following up with them. Data gathered regarding patient reviews and staff feedback differed between cycles as the project developed, making it harder to compare outcomes.

The EHCH framework highlights variable access for care home residents to NHS services [26] but does not specifically mention mental health. Our project supports the Royal College of Psychiatrists report on delivering the Long-Term Plan advocating mental health input as central to care home services [27]. The BGS policy calls for access to CGA, personalised care plans and follow-up for all older people with frailty, dementia, complex and long-term conditions. Our intervention provides a mechanism to deliver on these policies, creating an opportunity for shared learning and enabling residents to receive more specialist care.

Conclusion

This was an effective multi-disciplinary project which facilitated CGA within the RH setting whilst focussing on reducing polypharmacy and improving end-of-life care. This had a perceived impact on both physical and mental health of the residents. The MDT were able to benefit from the shared learning opportunities and improved inter-professional relationships. This project demonstrates a sustainable model which could be applied to other RHs.

Abbreviations

RHs Residential Homes

ACP Advance care planning

EHCH Enhanced Health in Care Homes

NHS National Health Service

MDT Multi-disciplinary team

BGS British Geriatrics Society

CGA Comprehensive Geriatric Assessment

GP General Practitioner

CQC Care Quality Commission

HRG Healthcare Resource Groups

HEE Health Education England

UCLP University College London Partners

BPSD Behavioural and psychological symptoms of dementia

DNACPR Do Not Attempt Cardio-Pulmonary Resuscitation

CMC Coordinate My Care

PEACH Proactive Healthcare of Older People in Care Homes

QIC Quality improvement collaborative

Declarations

Ethical Approval

This was a quality improvement project, sponsored by HEE and UCLP who are part of the Academic Health Science Networks; driving adoption and spread of innovation across healthcare. The project was led by local GPs and was an enhancement of their usual service. The implementation of the project was monitored by HEE. Staff were given the option of whether they wished to complete questionnaires or not. Under UK 'Governance Arrangements for Research Ethics Committees', ethical research committee review is not required for service evaluation or research which elicits the views, experiences and knowledge of healthcare professionals. This project would qualify as a service evaluation with NHS staff, recruited as research participants by virtue of their professional roles and the requirement for ongoing professional development. This does not require ethical review from an established NHS research ethics committee.

Consent for publication

Not applicable

Availability of data and materials

All data generated or analysed during this study are included in this published article

Competing interests

I declare that the authors have no competing interests as defined by BMC, or other interests that might be perceived to influence the results and/or discussion reported in this paper.

Funding

No funding was provided.

Authors' contributions

AS and HH conceived and developed the study. They orchestrated collection of data and wrote the paper.

EG was involved in development and coordination of the intervention and made substantial contributions to data collection.

ELS assisted with writing of the paper and approved the final version.

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Tables

Table 1: Care home and resident demographics

Cycle 1	Cycle 2
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	Care Home 1	Care Home 2	Care Home 3
Location	North London (urban)	North London (urban)	North London (urban)
Type of care	Residential	Residential	Residential
Number of nursing staff	0	0	0
Beds	21	35	73
Care Quality Commission (CQC) rating (date of inspection)	'Good' (July 2017)	'Good' (October 2017)	'Inadequate' (December 2018)
Number of sessions held	5	2	10
Dates of sessions	Sept 2017 – Jan 2018	Nov 2017 – Feb 2018	March 2019 – Dec 2019
Number of residents assessed	9	4	21
Mean age (range)	82.1 (62-95)	80.8 (78-84)	86.4 (77-97)
Male: female	5:4	0:4	11:10
Mean number of medications (range)	9.0 (4-18)	10.0 (5-12)	7.1 (2-18)
Mean number of comorbidities excluding dementia (range)	7.8 (4-13)	9.3 (6-15)	6.7 (3-16)
Number with pre-recorded dementia diagnosis (% of total participating residents)	7 (77.8%)	4 (100%)	16 (76.2%)
Number of new diagnoses of dementia made during intervention (% of total participating residents)	0 (0%)	0 (0%)	0
Number of residents with BPSD (% of participating residents with dementia)	3 (42.9%)	4 (100%)	16 (100%)
Mean Rockwood frailty score (range)	6.6 (6-8)	6.0 (5-7)	7.3 (6-9)
Number with capacity to decide about the treatment plan (% of total participating residents)	1 (11.1%)	0 (0%)	4 (19.0%)

Table 2: Data outcomes

	Cycle 1		Cycle 2
No. residents receiving intervention	Care Home 1	Care Home 2	Care Home 3
Presenting complaints	<ul style="list-style-type: none"> ● Stealing other residents' food in context of dementia ● Worsened cough and breathlessness ● Cognitive decline and refusal of medications including warfarin ● Aggression and paranoia ● Breathlessness and ankle swelling ● Weight loss, day time drowsiness ● Uncommunicative, decline in mobility, decline in oral intake ● Pain and poor mobility ● Falls 	<ul style="list-style-type: none"> ● Sleeping in chair, leg pain and swelling ● Anxiety, agitation ● Recurrent UTI, generally unwell and has been in bed for a no. of weeks ● Rash, hallucinations and delusions 	<ul style="list-style-type: none"> ● Weight loss ● Difficulty breathing ● Challenging behaviour ● Swollen legs ● Refusing medication ● General decline possible depression ● Reduced oral intake ● Reduced mobility ● Low mood, insomnia ● Slowing and movement disorder ● Falls ● Depression in context of dementia ● New patient needing CGA ● Loose stool, anaemia
Number of GCA reviews held	9	4	21
Mean change in number of medications (range)	-1.4 (-3 to +1)	-0.3 (-1 to 0)	-2.1 (-18 to +1)
Change in BPSD (staff report)	3/3 improved	1/4 improved 3/4 no different	Data not collected
Change in BPSD (family report)	3/3 improved	2/4 improved 2/4 no different	Data not collected
Number of reviews attended by relatives (% of total participating residents)	1 (11.1%)	0 (0%)	1 (4.8%)
Number of residents with ACP initiated or reviewed	7 (77.8%)	3 (75%)	16 (76.2%)

(% of total participating residents)			
Number of DNAR forms completed or reviewed pre- and post- MDT (% of total participating residents)	6 newly initiated (66.7 %)	2 newly initiated (50.0%)	Pre-MDT = 4 (19%) Post-MDT = 19 (90.5%)
Number of patients with Coordinate My Care record created (% of total participating residents)	0 (0%)	0 (0%)	8 (38.1%)
Project period (months)	7	3	10
Actual number of admissions to hospital during the project period in intervention residents (no. per month)	1 (0.16)	0 (0.0)	Data not collected
Number of admissions among participating residents in 12 months prior to reviews (mean per person over 12 months)	Data not collected	25 (1.19)	
Number of admissions among participating residents in 12 months post review (mean per person over 12 months)	Data not collected	6 (0.29)	
Reduction of admissions among participating residents over 1 year (mean per person over 12 months)	Data not collected	19 (0.9)	
Costs of hospital admissions for the whole care home	Data not collected	12 months prior to intervention £55 678 During year of intervention £49 653	
Number of educational sessions	5	2	9
Topics of half hour educational sessions	<ul style="list-style-type: none"> ● Polypharmacy and medication errors ● Challenging behaviour in dementia Nutrition Pain in dementia Difficult ACP discussions 	<ul style="list-style-type: none"> ● Dementia pre-diagnosis counselling ● Cardiovascular complications in geriatrics 	<ul style="list-style-type: none"> ● Skin care in the older patient ● Advance care planning ● Nutrition and weight loss ● Morbidity and mortality meeting ● End of life in the care home ● Old age psychiatry ● Behavioural symptom management ● Rationalisation of medications

				Communication between primary and secondary care
Total time for educational sessions	● 2.5 hours	● 1 hour	● 4.5 hours	
Mean number of participants in MDT and educational sessions	● 7.3 (7-9)	● 7.5 (7-10)	● 8 (7-11)	
Mean number of medical/pharmacy students attending	● not collected	● not collected	● 2 (0-4)	
Mean session rating based on team (non-care home staff) feedback	● 9 out of 10	● 10 out of 10	●	

Figures

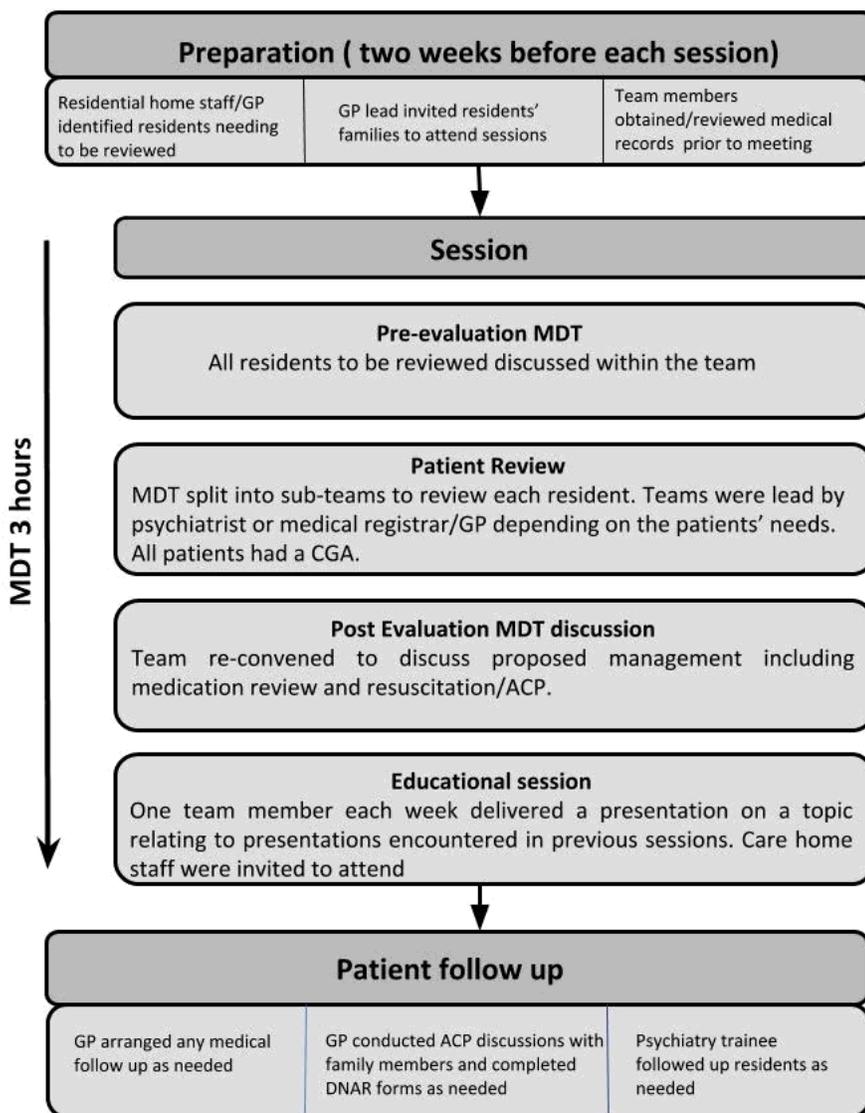


Figure 1

Design for each monthly session