Appendix 4 (as supplied by the authors): Components of quality improvement strategies examined in the included studies	
Study, QI strategy	**Intervention components**
Botha 2014 (1) (CR: Botha 2010 (37)), Case management, team changes	- Senior social worker or a chief professional nurse engaged patients and carers prior to discharge, with the primary focus on building a therapeutic relationship - The nature of the intervention was tailored as closely as possible to the international model of assertive community treatment, with the two main exceptions being the size of caseloads and frequency of visits. It was agreed at the outset that caseloads carried by international teams would not be realistic in the context of an under-resourced, developing country. A consensus caseload number of 80 patients per team was reached, with individual caseloads not exceeding 35 - Key workers acted as main care coordinators, but caseloads were often shared between members of the team. A major focus of the team was on engagement and maintenance of adherence to treatment - Since resources were limited, the team focused on strengthening access to existing resources in the community and building new ties with organizations that may offer additional services - Patients were frequently referred to occupational therapy and psychology services, although no full time staffing was available from these disciplines. Since there are no inpatient dual diagnosis rehabilitation facilities in the area, patients were referred to mainstream programs when this service was required - The majority of contacts (>50%) were in the community, mainly in the form of home visits
Burns 2014 (2), Case management, self-management, patient education	- The quality improvement team developed a 30-day intervention in which a hospital-based, bilingual community health worker worked with the patient, caregivers and the inpatient and outpatient care teams to facilitate the transitions from hospital to home and back to the primary care provider - The intervention approach included the following components: one or more introductory visits with patients in the hospital; community health worker participation in the hospital discharge process (including post-discharge needs and post-discharge planning regarding appointments, patient education, medications, home services, health insurance); semi-structured calls to patients on at least a weekly basis to elicit patient concerns; and liaison calls, as needed, to primary care nurses to assist in scheduling or to respond to patient concerns. A telephone script for the outreach calls prompted the community health worker to address topics such as reminders and transportation assistance for upcoming appointments, barriers to obtaining medications, concerns that might require nurse intervention and poor understanding of self-management instructions.
Gellis 2014 (3) (CR: Gellis 2012 (38)), Case management, self-management, patient education, clinician education, facilitated relay	- The telehealth monitoring system transmitted patient data via a telephone line from the home monitoring unit located in the patient' s home to a central station located at the home care office. Patient data was displayed and triaged by color coding to allow immediate determination of nurse plans of care, tasks, and counseling. Patients having abnormal readings were contacted by the telehealth nurse for further evaluation. - The nurses were also trained in psychoeducation and problem-solving therapy strategies, based on previous research - The telehealth monitoring system was provided to home care patients to enhance the patients' self-management of their medical condition through a greater understanding of their disease processes. - Patients obtained education on the disease process and counseling about the importance of daily monitoring of body weight, smoking cessation, behavioral activation, proper diet, medication adherence, problem solving strategies on managing their daily medical condition, and monitoring of symptoms that may be indicative of worsening heart failure. Counseling was tailored to each patient ' s medical and psychological needs. - The telehealth nurse was available to the patient daily, by telephone, and also for urgent home visits as needed.

Ruchlewska 2014 (4), Self-management	- Clinicians (mostly psychiatric nurses) composed a crisis plan as part of the patients' regular treatment. Crises precipitating factors were discussed and strategies were developed for preventing them. The patient and his or her clinician formulated the content of the crisis plan together. The procedure contained several stages: the preparation and formulation of the crisis plan, an informed discussion, and the collection of signatures of everyone involved in the development process (e.g. the partner, friends or family). The final step was to summarize the plan on a crisis card, which was then handed to the patient. The content of the crisis plan has to be evaluated annually or more frequently if necessary. All crisis plans were included in the patients' records and in the electronic records of all emergency psychiatric services with which the patient might come into contact during a crisis.
Puschner 2011 (5), Team changes, self-management	- Two intervention sessions (predischarge and monitoring) to provide information (needs assessment-based standardized recommendations) for outpatient treatment and monitoring of compliance with these recommendations. A standardized summary was entered into the discharge plan that was signed by all participants. This plan had every single need discussed with a precise problem definition, objectives, timeframe of its achievement and the person(s) responsible for implementation - After discharge, a typed version of the discharge plan was sent to the treating outpatient clinician and to the patient. Both were instructed to discuss all relevant topics and to monitor progress of implementation at every aftercare appointment - Post-discharge session: three months after discharge, the discharge monitoring took place with patient, out-patient clinician, carer (if desired by patient) and intervention worker. Again, the session was based on current standardized needs assessment including the comparison with care needs at baseline ('needs development') - During a structured discussion, a resume was drawn of the course, critical problem areas and implementation of the discharge plan. Results of this discussion were summarized in a written post-discharge plan which was signed by all participants. Again, the patient and clinician were asked to discuss and monitor implementation of this plan at every meeting during the next 3 months.
Courtney 2009 (6), Case management, team changes, self-management, patient education	- Within 72 hours of admission, a registered nurse and physiotherapist undertook a comprehensive patient assessment and developed a goal-directed, individualized care plan in consultation with the patient, health professionals, family, and caregivers. - The care plan included an individually designed exercise program prescribed by the physiotherapist included four components: muscle stretching, balance training, walking for endurance, and muscle strengthening using resistance exercises - The nurse visited daily during participants' hospital stays to address concerns, facilitate the exercise program, and oversee discharge planning. While the participant remained in the hospital, the nurse developed a transitional care plan covering the areas of functional ability and need for assistance with activities of daily living, postdischarge treatments and follow-up care, social support, chronic disease management plans and information, medication information, community services, and assistance with the exercise program. The nurse and physiotherapist combined their visits when planning, explaining, and demonstrating the exercise program to ensure continuity when the nurse continued to facilitate the exercise program during extended hospital stays and at home. Written guidelines were provided on postdischarge management, including diagrams and specific instructions for their exercise program. - Within 48 hours of discharge, the nurse undertook a home visit to assess availability of support, address transitional concerns, provide advice and support, and ensure that the exercise program could be safely undertaken at home. Extra home visits were provided if required. Weekly follow-up telephone calls were provided for 4 weeks, followed by monthly follow-up for a further 5 months. - During the telephone follow-ups, feedback was sought on issues identified in the hospital or during the home visit, general health, level of support available, management of treatment regimes, health-promotion activities, any new problems or concerns, levels of adherence to the exercise program, and progress with the exercise plan and goals. These were adjusted to reflect progress or difficulties during the preceding time period, and advice, information, positive feedback, and support were offered.

Killaspy 2009 (7) (CR: Killaspy 2006 (39)), Case management, team changes	- Assertive community treatment using local community mental health teams, with integrated health and social care professionals - Teams met with patients out of office (homes, in cafes, etc) - Assertive engagement included multiple attempts, flexible and various approaches (for example, befriending, offering practical support, leisure activities) - Commitment to care was ""No drop-out" policy: continue to try to engage in long term care" - Team approach—all team members work with all clients. - Source of skills was in team rather than outside agencies as far as possible - Teams had a total case load of 80-100 patients and case managers had a maximum individual case load of 12 patients
Koehler 2009 (8), Team changes, case management, self-management, patient education, clinical information system	- Starting no later than 24 hours after enrollment and continuing up to 1 week following hospital discharge, intervention group patients received a targeted care bundle provided by 1 of 3 care coordinators and 1 of 4 clinical pharmacists working with the study team. - Study care coordinators saw patients daily throughout their hospital stay, and instructed patients on specific health conditions, with an emphasis on optimizing home self-care and contingency plans if problems arose. Clinical pharmacist visits focused on medication reconciliation and education regarding any new agents started during the hospitalization. The personal health record (PHR) provided a tool to engage patients in self-care, and promoted information transfer from the hospital to outpatient settings. During the postdischarge phone call, care coordinators followed a basic script to confirm receipt of medical equipment, medications, home health arrangements, and scheduling of follow-up appointments. They also used this contact as an opportunity to reinforce patient education on managing their conditions. Clinical pharmacists reviewed medication use (type, schedule, dose), and spoke with patients about any symptoms they may have experienced as medication side effects. If indicated based on their phone discussions, both care coordinators and clinical pharmacists could recommend an action plan to the patient. -
Bellon 2008 (9), Self-management, continuous quality improvement, clinician education	- The three doctors in the intervention group undertook an interactive workshop training session (15 hours) on the '7 hypotheses + team' (7H+T) intervention. This intervention encourages doctors to select from a list of seven possible hypotheses for why the patient is a frequent attender: biological, psychological, social, family, cultural, administrative-organizational, or related to the doctor–patient relationship - They then share with other doctors their analyses about the hypothesis and the plans derived from it, which is the 'team' aspect of the intervention. The 7H+T is a methodical intervention performed by a team of doctors but implemented individually. The 7H+T intervention is performed in a step-like sequence - The GP makes plans for each frequent attender based on the confirmed hypothesis and available resources. These plans are then commented on at the group meeting, after which the GP negotiates the plan with the frequent attender. The plan includes a search for solutions to the patient's health problem from both points of view. - GPs hold meetings to share analyses and reflections on their frequent attenders and make plans for each frequent attender. Moreover, the GP team provides emotional support to each GP and generates strategies to deal with frequent attenders from a more neutral perspective. The time spent sharing each reflection about a frequent attender ranges from 5 to 35 minutes. The GP team sets regular meetings to discuss (and possibly coming to a consensus agreement about) the hypotheses and plans for all the patients included in the intervention group.
Lichtenberg 2008 (10), Case management, team changes, self-management	- Case managers provided ongoing assessment of the client's needs, assessment of the client's abilities to fulfill those needs, defining the anticipated outcome of care, monitoring of progress towards the anticipated outcome, identifying the client's social support system, in particular the principal caregiver, whose needs and abilities were also assessed, defining the formal system of care which the client required (sheltered housing, rehabilitation workshop and social club), developing and implementing together with the client, his or her family and the multidisciplinary team, a plan and partnership for treatment, empowering the client to

	utilize the relevant services, providing the client with the information needed to gain access to rehabilitation facilities, advocacy on behalf of the client before the relevant agencies, assistance in maintaining compliance with treatment, including outreach for missed appointments at the clinic or at various agencies for assistance, providing training for the skills necessary to conduct daily activities, availability for crisis intervention with the client and his or her family, involvement in decisions about hospitalization or discharge, and supportive psychotherapy as needed. - At times psychotherapy will be conducted by another member of the multi-disciplinary team (including a social worker, psychologist, psychiatric nurse), in which case the case manager will continue to oversee the treatment - Each case manager was expected to carry a client load of 30 patients
Shumway 2008 (11), Case management	- Case management included assessment, crisis intervention, individual and group supportive therapy, assistance in obtaining stable housing and income entitlements, linkage to medical care providers, referral to substance abuse services when needed, ongoing assertive community outreach to maintain continuity of care - Each social worker followed a maximum caseload of 15 patients
Rivera 2007 (12), Case management	- Services were organized along the strengths model, with high fidelity to the various design elements. Care was provided individually with use of natural community resources and with backup from a team member. Caseloads were limited to 20 persons. A core element of the strengths based approach is venerating the client. This means respect for the client's autonomy, focusing on the client's wants, and treating the client as a person rather than a case to be managed. The personalistic focus deemphasizes the role relationship and professional distance. The strengths-based provider may self disclose more, socialize with the consumer, and spend more effort on building the relationship
Schreuders 2007 (13) (CRs: Schreuders 2005 (40), Bosmans 2012 (41)), Case management, self-management	- Nurses were trained to treat patients with mental health illness. The training consisted of workshops that focused on the features of mental health problems in primary care, the theory and rationale of problem-solving treatment, and role-play exercises supervised by the trainers. The role playing was videotaped and evaluated. In the second part, the nurses treated four pilot patients, closely supervised by a cognitive behavioural therapist. Audiotapes were made during treatment of the pilot patients and feedback was given during supervision sessions. - The treatment is brief (less than 4 hours), and focuses on practical skill building. It consists of a maximum of six sessions, each of which contains seven steps of problem solving, which are applied in a systematic manner to achieve problem resolution for everyday problems, such as not being able to do all the housework in one day, or not being able to do activities they like - The rationale is that the treatment increases the patient's understanding of the relationship between everyday problems and psychological symptoms - The goal of problem solving treatment is to stimulate an active attitude towards these everyday problems, and by reaching goals in the everyday problems, achieve a reduction in mental health problems - Problem-solving treatment contains seven stages: Explanation and rationale, Problem definition, Establishing achievable goals, Generating solutions, Selecting preferred solution, Implementing solution, Evaluation of progress - Strategies for coping with present and future problems were provided by
Sledge 2006 (14), Case management, team changes, self-management	- Comprehensive interdisciplinary assessment lasted two to three hours on the first visit and was informed by a lifetime medical chart review as well as supplemental information obtained by the case manager from family members, primary and subspecialty care providers, and key social supports. During the visit, patients had a full assessment by the team - This team crafted a single report addressed to the primary care provider. Recommendations were phrased to offer support and assistance to providers in caring for their patients and included anywhere from two to 10 patient-specific measures that the team believed would optimize chronic illness management and patient coping skills and thus, potentially, avert preventable re-hospitalizations. This report was presented to the primary provider by the case manager in person for discussion as well as copied to all of the patients' subspecialty providers and the medical record

	- Case manager use a flexible patient-centered approach to improve coordination of care, self-care patterns, and coping skills. Also assessed needs and offered assistance with referrals and appointments - Case manager was encouraged to use all means available to enhance outpatient care with the expectation that enhanced outpatient care would reduce the need for hospital admissions - Case manager worked closely with the primary care providers. In no case did a primary care provider reject team recommendations - Involvement over the year varied significantly based on patients' needs, but at minimum included a monthly telephone call to assess needs, offers of assistance with referrals and appointments, and phone/pager availability to patients 5 days per week - Case manager caseload was organized so that her maximum enrollment at any one time was 21, 20 h per week, distributed so that case manager attended part of each daily clinic session in order to allow maximal interaction with providers
Scott 2004 (15) (CR: Coleman 2001 (42)), Team changes, patient education	- Research staff contacted intervention members by telephone to schedule an initial group meeting. Groups met with their primary care physician and a nurse every month for 90 minutes. Other providers (e.g., physical therapists, pharmacists, occupational therapists, and individuals representing community resources) attended as needed, depending on the topics scheduled for discussion during the group visit - A typical group meeting consisted of a warm-up period, an education component, a care giving period, and a question and answer period, followed by planning the next meeting. A 30-minute presentation on specific health-related topics followed the warm-up period. Six core topics were presented during meetings after introduction to the program: patient care notebooks, routine health maintenance, pharmacy brown bags, advanced directives, emergency care, and continuing care. Other topics included chronic pain; nutrition; exercise; home safety; and disease processes such as stroke, hypertension, arthritis, osteoporosis, and Alzheimer's disease. Participants requested some topics. After each meeting, the physician would meet briefly one-on-one with individual patients as needed and the nurse took blood pressures; reviewed patient charts for immunizations, laboratory tests, and immediate healthcare needs; and scheduled future, individual physician visits, if needed
Castro 2003 (16), Case management, self-management, patient education	- Asthma education provided to patients, which was appropriate to the patient's education, motivation, and cultural beliefs - All patients received psychosocial support and screening patients for professional counseling - An individualized asthma self-management plan was established - Nurses consulted with social service professionals to facilitate discharge planning - Nurses followed patients through the telephone, home visits, and follow-up appointments with the primary physician
Laramee 2003 (17), Case management, team changes, patient education, self-management	- The intervention was performed by one case manager and consisted of 4 major components: (1) early discharge planning and coordination of care, (2) individualized and comprehensive patient and family education, (3) 12 weeks of enhanced telephone follow-up and surveillance, and (4) promotion of optimal medications and medication doses based on consensus guidelines - While the patient was in the hospital and for the next 12 weeks, the case manager assisted in the coordination of care by facilitating the discharge plan and obtaining needed consultations from social services, dietary services, and physical therapy/ occupational therapy. When indicated, arrangements were made for additional services or support once the patient had returned home. - The case manager also facilitated communication in the hospital among the patient and family, attending physician, cardiology team, and other medical care practitioners through participating in daily rounds, documenting patient needs in the medical record, submitting progress reports to the primary care physician, involving the patient and family in developing the plan of care, collaborating with the home health agencies, and providing informational and emotional support to the patient and family

Harrison-Read 2002 (18), Case management, team changes, self-management	- Intensive case management and assertive Community Treatment by a social worker, psychologist, psychiatrist, nurse, and occupational therapist - The case manager formulated a new care plan designed to complement and augment any existing care program for each patient, after full review of the patient's current care program and discussion with all members of the study team and with all other professionals involved with the patient - The case manager attempted to engage patients by frequent contacts (usually at least weekly in the first stages) in patients ' own homes to assist in activities of daily living, to ensure basic needs (food, finance, housing, medical care), and to encourage adherence to prescribed medication and psychological treatments aimed at minimizing symptoms and impairments - In developing new care plans, particular emphasis was placed on better control of symptoms, and adherence to medication, relapse prevention, early recognition of relapses, and coping with crises by early calls for help from previously identified and agreed sources. Attention was focused on the individual's previous pattern of heavy use of in-patient services and strategies developed to reduce the patient's previous heavy reliance on hospital admissions - The whole team met for formal clinical reviews twice weekly, and each patient's management was discussed at least weekly. - Individual team members were allocated case managers for between eight and 15 subjects (depending on the complexity of the care plans concerned). All members of the team apart from the consultant psychiatrist took on case manager responsibilities - The case manager could call upon the active involvement of other team members in devising and delivering care plans in order to meet patients ' needs effectively. - Other interventions available included supportive counseling, housing, vocational and benefits advocacy, carer support and family psycho-education.
Kasper 2002 (19), Case management, team changes, self-management, patient education, financial incentives	- The nurse coordinator made follow-up calls to patients within 72 h of hospital discharge, then weekly for one month—twice in the second month and monthly thereafter, unless a problem occurred that required more frequent contact. The telephone nurse coordinator followed a set script and pursued problems as clinically indicated, but did not adjust medications over the telephone - The chronic heart failure nurses were assigned to assist the intervention group and helped to implement the therapeutic plan designed by the chronic heart failure cardiologists. Patients had at least monthly follow-up with these nurses. Most visits occurred in chronic heart failure clinics located at each site, but some occurred in the patient’s home. The CHF nurses adjusted medications under the directions of the chronic heart failure cardiologists, following a prespecified algorithm, which included initiation and titration of angiotensin-converting enzyme inhibitors, beta-blockers and diuretics. The algorithm included a 2-g sodium-restricted diet, as well as a recommendation to exercise by walking for 20 min at least four days per week. The treatment plan was individualized for each patient - All members of the team, except for the patients’ primary physicians, participated in weekly patient care meetings. - Patients with limited financial resources were provided, if needed, a scale, a 3-g sodium “Meals on Wheels” diet, medications, transportation to the clinic and a telephone - All patients were supplied with a pill sorter, a list of correct medications, a list of dietary and physical activity recommendations, a contact number available 24 h/day and patient education material

Katzelnick 2000 (20) (CR: Simon 2001 (43)), Case management, patient education, clinician education	- Principal elements of the program were physician education, patient education, antidepressant treatment, and treatment coordination - Prior to patient enrollment, all physicians participated in a standardized 2-hour training program focused on the initial assessment of depression and the initiation of pharmacotherapy - At each health plan, 1 or 2 psychiatrists were identified as consultants for the program. - At the time of enrollment, all study patients were asked to schedule an evaluation visit with their primary care physician. Prior to this visit, patients received a booklet created for the study "Depression Isn't Just a Mental Problem" and videotaped educational materials from the treatment coordinator designed to increase acceptance of depression treatment - At the initial visit, primary care physicians confirmed the diagnosis of depression, assessed contraindications to pharmacotherapy, and (if indicated) recommended antidepressant treatment. Patients who had psychotic symptoms, mania, or acute suicidality were immediately referred to psychiatrists - Primary care physicians were advised to follow a specific pharmacotherapy algorithm, but were allowed to adjust treatment according to individual clinical need. The treatment algorithm recommended that patients who had previously been successfully treated and tolerated an antidepressant be given the previous antidepressant. - Treatment coordinators contacted patients for telephone monitoring of treatment adherence; treatment response; and medication adverse effects - Study psychiatrists had ongoing contact with all intervention group primary care physicians via periodic case reviews and as needed telephone consultation. - A psychiatric consultation visit was strongly encouraged for all patients not responding to treatment by 10 weeks and for patients with more complicated depression.
Salkever 1999 (21), Case management, team changes, patient education	- Program for Assertive Community Treatment model was used - Majority of staff devoted time to services in the community - Use of a team approach including community mental health professionals and a shared caseload approach across teams in delivering services - Emphasis on rehabilitation through teaching individual living skills in vivo in the community and through participation in psychosocial day programs - Training of both teams by personnel from the original Madison Program for Assertive Community Treatment model - Staff psychiatrists had principal responsibility for providing psychiatric services in the intervention programs
Burns 1999 (22) (CRs: UK700 (44), Burns 2000 (45), Burns 2002 (46), Hassiotis 2001 (47)), Case management	- Intensive case management (case load 10–15 patients per case manager) - Case managers were taught outreach practices

Coleman 1999 (23), Team changes, self-management, clinician education	- Half-day visits with patients and their primary care team every 3 to 4 months - The specific components of these quarterly visits included: 1. An extended (30 minutes) visit to the patient's physician and team nurse dedicated to developing a shared treatment plan that emphasized the reduction of disability 2. A session with the pharmacist (15 minutes) held in the primary care examination room, that addressed polypharmacy and medications associated with functional decline. 3. A patient self-management group session (45 minutes), led by a team nurse or social worker, that emphasized self-management skills and group problem-solving for chronic health problems (individual groups were encouraged to select the topics, -some of which included physical activity, nutrition, and advanced care planning). 4. The provision of health status assessment information to the practice team at the time of the visits. This assessment included the systematic collection of information regarding each participant's health status, chronic conditions (including geriatric syndromes), and current medications - Physicians and team nurses also received training in population-based medicine and management strategies designed to enhance their management of selected geriatric syndromes. Team nurses received individual on-the-job coaching from study staff. Study staff provided intervention physicians with: (1) Brief (one-page) evidence-based treatment strategies for the selected geriatric syndromes; (2) Health status assessment information that included information on functional status as well as the geriatric syndromes of interest for each patient attending the visits; (3) Key points from the management strategies highlighted on a care-planning worksheet for syndromes identified through health status assessment; and (4) A one-time case-based care conference guided by a geriatrician from the research team was held in place of the weekly staff meeting for intervention physicians and team nurses. The conference emphasized the formulation of a treatment plan that incorporated geriatric care priorities
Gagnon 1999 (24), Case management	- Nurse case managers were expected to integrate care from a health maintenance and promotion perspective. This included supporting the older people and their caregivers during times of transition related to health status, environmental changes, and changes in resource needs - The nurse case manager coordinated the work of all healthcare providers involved in the care of the patient to create and implement a responsive plan of care - Patients were placed on a framework consisting of assessments and interventions with appropriate outcomes to promote functional autonomy - Patient data was reviewed by the informal caregiver. Perceived needs and concerns of the patient and caregiver were reviewed. The nurse focused on coping abilities of the patient and encouraged maximal autonomy - Nurse case managers were encouraged to manage issues over the telephone and to link the patient to the required services and contacted patients monthly by phone and every 6 weeks in the patient's home - Case managers had access to hospital geriatrician, geriatricians from community health centers, the patient's family physicians, and staff physicians during hospitalizations. - Case managers were also members of existing interdisciplinary teams in their respective community health centers. These teams consisted of community-based family physicians, psycho-geriatricians or psychologists, social workers, occupational therapists, physiotherapists, and dieticians. The team's primary task was to allocate services requested - Each nurse case manager worked with 40-55 older adults over the duration of the study and were required to develop a guide to community services available to her client
Essock 1998 (25) (CR Essock 2006 (48)), Case management, team changes	- Assertive community treatment intervention - Clients had 9 hours of face-to-face contact with staff, including physicians, nurses, and a part-time psychiatrist - Achieved 24hrs coverage by using a crisis program for some off-hours coverage - Clients received case management, outpatient clinical services, mobile outreach and crisis intervention services

Stewart 1998 (26), Case management, team changes, patient education, self-management	- One week after discharge, the patients were visited at home by a pharmacist and study nurse. The patient's knowledge of medications was assessed and those with poor knowledge or malcompliance received: 1) remedial counseling, 2) initiation of a daily reminder routine to enhance timely administration of medications, 3) introduction of a weekly medication container enabling predistribution of dosages, 4) incremental monitoring by caregivers, 5) provision of a medication information and reminder care, and 6) referral to a community pharmacist for more regular review therafter
Beck 1997 (27), Team changes, patient education, facilitated relay	- Patients were contacted by the study nurse and scheduled for their initial group visit and scheduling for future group visits occurred at the first visit. At the first group visit, the health care team was introduced and the ground rules for the groups were established, including participants respecting each others' opinions, responsibility for asking questions and the importance of keeping the group appointments. Patient concerns about specific health care issues were discussed at the initial visit in order to incorporate them into future discussion topics - Physicians' schedules were modified to incorporate monthly group visits for the 12 month duration of the intervention - A clinical psychologist from the mental health department attended the first three sessions of each group in order to facilitate the bonding of the groups. Group visits allow for socialization of medications and drug related problems, exercise, nutrition, alternative care, home safety, advance directives and use of emergency care services - A nurse measured blood pressure and medical record reviewed. Time was allocated for brief one-on-one visits with the physician as necessary - Patients were given their own summarized medical record to keep and to bring to each visit for review and update by the nurse
Spillane 1997 (28), Team changes	- Individualized care plans were developed, which included a social and medical history, typical emergency department presentation, and suggestions for care, as well as the phone numbers of involved social workers, physicians, clinic nurses, and family members. The care plans were written by the physician investigator and 1 of 6 emergency nurse practitioners who were familiar with the patients - Each care plan was reviewed and approved by both the physician and the nurse practitioner investigators. Examples of suggestions for care included suggestions to limit x-rays and laboratory tests, protocols for pain management for patients with sickle-cell disease, and places to which the patient could be safely released from the emergency department. The care plans contained cautions and guidelines for care and were not intended to replace physician judgment. These care plans were kept in the emergency department and were available to the emergency department personnel at all times - Upon the initial visit, a primary care provider was appointed. Multidisciplinary case conferences were held soon after the patient made an initial visit, including the emergency department physician investigator, emergency nurse practitioner, primary care provider or clinic nurse, social worker, and psychiatrist or psychiatric nurse. - Conferences focused on coordinating each patient's care both in the emergency department and within the outpatient clinic setting, and strategies to coordinate care outside the emergency department
Lafave 1996 (29), Case management, team changes, self-management	- Clients in the assertive community rehabilitation program received support from a team including a psychiatrist, nurse, social workers, vocational counselor, and a support worker with mental illness who were available 24 hours a day, 7 days a week - Contacts occurred in clients' homes, shopping malls, restaurants, and places of work - Clients were admitted to the hospital for an assessment and individual treatment plans aimed at returning them to their community were developed, and psychosocial rehabilitation approaches were used by hospital treatment teams - After hospital discharge, clients were followed up by team members - Team members often traveled distances of up to 70 miles to provide services

Quinlivan 1995 (30), Case management	- The staff-to-client ratio in the intensive case management program was based on the findings of Stein and Test, which called for staff to have small caseloads and frequent contact with clients - All members of the intensive case management team shared responsibility for client care and shared information on clients' status in daily team meetings - The frequency of client contacts provided in the intensive case management program far exceeded that in traditional case management programs - The staffing pattern of the intensive case management program allowed staff to see clients as often or as little as was needed
Rich 1995 (31) (CR: Rich 1996 (49)), Case management, team changes, self-management, patient education	- Intensive patient education about congestive heart failure and its treatment by an experienced cardiovascular research nurse, using a teaching booklet developed by the study investigators for geriatric patients with heart failure - Individualized dietary assessment and instruction given by a registered dietitian with reinforcement by the study nurse - Consultation with social-service personnel to facilitate discharge planning and care after discharge - An analysis of medications by a geriatric cardiologist who made specific recommendations to eliminate unnecessary medications and simplify the overall regimen - Intensive follow-up after discharge through the hospital's home care services, supplemented by individualized home visits and telephone contact with the members of the study team - The principal goals of follow-up were to reinforce the patient's education, ensure compliance with medications and diet, and identify recurrent symptoms amenable to treatment on an outpatient basis
Rosenheck 1995 (32) (CR: Rosenheck 1998 (50)), Case management, team changes	- Four core principles for the intervention were: 1) *Intensity.* Patients were to be seen as often as clinically indicated, and caseloads were to be low (7-15 patients per clinician) to facilitate frequent contact; 2) *Flexibility and community orientation.* Clinicians were urged to see patients wherever maximal clinical leverage could be obtained and were encouraged to provide most of the contacts in community settings. Special emphasis was placed on involving natural support systems in treatment (family members, landlords, employers, etc.); 3) *Rehabilitation focus.* Clinical contacts were to emphasize a broad range of rehabilitation services, including training in practical problem solving, crisis resolution, and adaptive skill building in natural settings. The focus of the interventions was to be on linkage with—and optimal usage of—both community and clinical resources, emphasizing in situ development of community living skills; 4) *Continuity of care.* teams were to be a "fixed point of continuing responsibility", assertively maintaining contact with even the most reluctant patients. If a patient moved away, for example, contact was to be maintained, even over long distances, by telephone - Teams met to review cases at least weekly (in some instances daily) and were available by phone after hours and on weekends to other clinicians and, through them, to patients, when necessary
Muijen 1994 (33), Case management	- Nurse case manager was involved in social issues ranging from welfare benefits to housing problems, as well as maintaining clinical input
Rich 1993 (34), Case management, self-management, patient education, team changes	- Detailed analysis of medications with specific recommendations designed to improve compliance and reduce adverse effects, and early discharge planning - Follow-up through home care and telephone contacts - Individualized patient education included daily visits during hospitalization by an experienced cardiovascular research nurse to discuss the diagnosis, symptoms, treatment, follow-up, and prognosis of chronic heart failure using a 15-page booklet - Detailed dietary history was obtained by a registered dietician, and an individualized 1.5- 2.0-gram sodium diet was designed, minimizing changes in established eating patterns. Dietary teaching was performed and reinforced daily by the study nurse. All medications were carefully reviewed with the patient (and/or caregiver responsible for dispensing medicines), and medication cards and charts detailing time and dose of all drugs were provided. Information was also given about possible side effects,

	particularly those that were potentially serious and that should prompt a call to the physician or study personnel. The importance of recording daily weights was emphasized and a chart was provided for this purpose, with instructions to contact study personnel for weight changes in excess of 3- 5 pounds. In some cases, scales for home use were provided - Prior to anticipated discharge, a careful medication review was performed by a geriatric cardiologist. The study nurse taught the patients about each medication and the overall dosing plan - The patients receiving the study intervention were also seen early in the hospital course by a social worker and a member of the home-care team to facilitate discharge planning and to ease the transition from the hospital to the home environment. Potential economic, social, and transportation problems were identified and managed appropriately. When indicated, arrangements were made for additional assistance or support once the patient returned home. Emotional support was also provided in the majority of cases - At the time of discharge, a discharge summary form was completed by the study nurse detailing medications, dietary and activity restrictions, and any anticipated problem areas identified by the social worker, hospital home-care representative, or study personnel. This form was transmitted to a nurse who then visited the patient at home within 48 hours (in most cases within 24 hours) of hospital discharge. In addition to surveying the home environment and identifying any additional problem areas, the home-care nurse again reinforced the teaching materials, reviewed medications, diet, and activity guidelines, assisted-with initiating the daily weight chart, and performed a general physical assessment and cardiovascular examination. In addition, the study nurse contacted all patients by telephone to assess their progress, answer any questions, and keep communication lines open
Bond 1988 (35), Case management	- Assertive case management program in addition to all other available mental health services. - Meet with patients in their community/home, attention to the practical problems of daily living, assertive advocacy on clients' behalf - Manageable caseload size, permitting workers to have frequent client contact, a team approach in which caseloads are shared, long term commitment to clients
Franklin 1987 (36), Case management	- Case management program developed by the Community Mental Health Center - 51% nonclinical services directly to clients, 39% brokering services, 10% other (travel, public relations, documentation of activities, training)

References

1. Botha UA, Koen L, Galal U, et al. The rise of assertive community interventions in South Africa: a randomized control trial assessing the impact of a modified assertive intervention on readmission rates; a three year follow-up. *BMC Psychiatry* 2014;14:56.
2. Burns ME, Galbraith AA, Ross-Degnan D, et al. Feasibility and evaluation of a pilot community health worker intervention to reduce hospital readmissions. *Int J Qual Health Care*. 2014; Apr. 16. [Epub ahead of print].
3. Gellis ZD, Kenaley BL, Ten Have T. Integrated telehealth care for chronic illness and depression in geriatric home care patients: the Integrated Telehealth Education and Activation of Mood (I-TEAM) study. *J Am Geriatr Soc* 2014;62:889-95.
4. Ruchlewska A, Wierdsma AI, Kamperman AM, et al. Effect of crisis plans on admissions and emergency visits: a randomized controlled trial. *PLoS ONE* 2014;9:e91882.
5. Puschner B, Steffen S, Volker KA, et al. Needs-oriented discharge planning for high utilisers of psychiatric services: multicentre randomised controlled trial. *Epidemiol Psychiatr Sci* 2011;20:181-92.
6. Courtney M, Edwards H, Chang A, et al. Fewer emergency readmissions and better quality of life for older adults at risk of hospital readmission: a randomized controlled trial to determine the effectiveness of a 24-week exercise and telephone follow-up program. *J Am Geriatr Soc* 2009;57:395-402.
7. Killaspy H, Kingett S, Bebbington P, et al. Randomised evaluation of assertive community treatment: 3-year outcomes. *Br J Psychiatry* 2009;195:81-2.
8. Koehler BE, Richter KM, Youngblood L, et al. Reduction of 30-day postdischarge hospital readmission or emergency department (ED) visit rates in high-risk elderly medical patients through delivery of a targeted care bundle. *J Hosp Med* 2009;4:211-8.
9. Bellón JA, Rodriguez-Bayon A, de Dios Luna J, et al. Successful GP intervention with frequent attenders in primary care: randomised controlled trial. *Br J Gen Pract* 2008;58:324-30.
10. Lichtenberg P, Levinson D, Sharshevsky Y, et al. Clinical case management of revolving door patients — a semi-randomized study. *Acta Psychiatr Scand* 2008;117:449-54.
11. Shumway M, Boccellari A, O'Brien K, et al. Cost-effectiveness of clinical case management for ED frequent users: results of a randomized trial. *Am J Emerg Med* 2008;26:155-64.
12. Rivera JJ, Sullivan AM, Valenti SS. Adding consumer-providers to intensive case management: Does it improve outcome? *Psychiatr Serv* 2007;58:802-9.
13. Schreuders B, van Marwijk H, Smit J, et al. Primary care patients with mental health problems: outcome of a randomised clinical trial. *Br J Gen Pract* 2007;57:886-91.
14. Sledge WH, Brown KE, Levine JM, et al. A randomized trial of primary intensive care to reduce hospital admissions in patients with high utilization of inpatient services. *Dis Manage* 2006;9:328-38.

15. Scott JC, Conner DA, Venohr I, et al. Effectiveness of a group outpatient visit model for chronically ill older health maintenance organization members: a 2-year randomized trial of the cooperative health care clinic. *J Am Geriatr Soc* 2004;52:1463-70.

16. Castro M, Zimmermann NA, Crocker S, et al. Asthma intervention program prevents readmissions in high healthcare users. *Am J Respir Crit Care Med* 2003;168:1095-9.

17. Laramee AS, Levinsky SK, Sargent J, et al. Case management in a heterogeneous congestive heart failure population: a randomized controlled trial. *Arch Intern Med* 2003;163:809-17.

18. Harrison-Read P, Lucas B, Tyrer P, et al. Heavy users of acute psychiatric beds: randomized controlled trial of enhanced community management in an outer London borough. *Psychol Med* 2002;32:403-16.

19. Kasper EK, Gerstenblith G, Hefter G, et al. A randomized trial of the efficacy of multidisciplinary care in heart failure outpatients at high risk of hospital readmission. *J Am Coll Cardiol* 2002;39:471-80.

20. Katzelnick DJ, Simon GE, Pearson SD, et al. Randomized trial of a depression management program in high utilizers of medical care. *Arch Fam Med* 2000;9:345-51.

21. Salkever D, Domino ME, Burns BJ, et al. Assertive community treatment for people with severe mental illness: the effect on hospital use and costs. *Health Serv Res* 1999;34:577-601.

22. Burns T, Creed F, Fahy T, et al. Intensive versus standard case management for severe psychotic illness: a randomised trial. UK 700 Group. *Lancet* 1999;353:2185-9.

23. Coleman EA, Grothaus LC, Sandhu N, et al. Chronic care clinics: a randomized controlled trial of a new model of primary care for frail older adults. *J Am Geriatr Soc* 1999;47:775-83.

24. Gagnon AJ, Schein C, McVey L, et al. Randomized controlled trial of nurse case management of frail older people. *J Am Geriatr Soc* 1999;47:1118-24.

25. Essock SM, Frisman LK, Kontos NJ. Cost-effectiveness of assertive community treatment teams. *Am J Orthopsychiatry* 1998;68:179-90.

26. Stewart S, Pearson S, Horowitz JD. Effects of a home-based intervention among patients with congestive heart failure discharged from acute hospital care. *Arch Intern Med* 1998;158:1067-72.

27. Beck A, Scott J, Williams P, et al. A randomized trial of group outpatient visits for chronically ill older HMO members: the Cooperative Health Care Clinic. *J Am Geriatr Soc* 1997;45:543-9.

28. Spillane LL, Lumb EW, Cobaugh DJ, et al. Frequent users of the emergency department: Can we intervene? *Acad Emerg Med* 1997;4:574-80.

29. Lafave HG, de Souza HR, Gerber GJ. Assertive community treatment of severe mental illness: a Canadian experience. *Psychiatr Serv* 1996;47:757-9.

Appendix to: Tricco AC, Antony J, Ivers NM, et al. Effectiveness of quality improvement strategies for coordination of care to reduce use of health care services: a systematic review and meta-analysis. *CMAJ* 2014. DOI:10.1503/cmaj.140289.

30. Quinlivan R, Hough R, Crowell A, et al. Service utilization and costs of care for severely mentally ill clients in an intensive case management program. *Psychiatr Serv* 1995;46:365-71.

31. Rich MW, Beckham V, Wittenberg C, et al. A multidisciplinary intervention to prevent the readmission of elderly patients with congestive heart failure. *N Engl J Med* 1995;333:1190-5.

32. Rosenheck R, Neale M, Leaf P, et al. Multisite experimental cost study of intensive psychiatric community care. *Schizophr Bull* 1995;21:129-40.

33. Muijen M, Cooney M, Strathdee G, et al. Community psychiatric nurse teams: intensive support versus generic care. *Br J Psychiatry* 1994;165:211-7.

34. Rich MW, Vinson JM, Sperry JC, et al. Prevention of readmission in elderly patients with congestive heart failure: results of a prospective, randomized pilot study. *J Gen Intern Med* 1993;8:585-90.

35. Bond GR, Miller LD, Krumwied RD, et al. Assertive case management in three CMHCs: a controlled study. *Hosp Community Psychiatry* 1988;39:411-8.

36. Franklin JL, Solovitz B, Mason M, et al. An evaluation of case management. *Am J Public Health* 1987;77:674-8.

37. Botha UA, Koen L, Joska JA, et al. Assessing the efficacy of a modified assertive community-based treatment programme in a developing country. *BMC Psychiatry* 2010;10:73.

38. Gellis ZD, Kenaley B, McGinty J, et al. Outcomes of a telehealth intervention for homebound older adults with heart or chronic respiratory failure: a randomized controlled trial. *Gerontologist* 2012;52:541-52.

39. Killaspy H, Bebbington P, Blizard R, et al. The REACT study: randomised evaluation of assertive community treatment in north London. *BMJ* 2006;332:815-20.

40. Schreuders B, van Oppen P, van Marwijk HW, et al. Frequent attenders in general practice: problem solving treatment provided by nurses. *BMC Fam Pract* 2005;6:42.

41. Bosmans JE, Schreuders B, van Marwijk HW, et al. Cost-effectiveness of problem-solving treatment in comparison with usual care for primary care patients with mental health problems: a randomized trial. *BMC Fam Pract* 2012;13:98.

42. Coleman EA, Eilertsen TB, Kramer AM, et al. Reducing emergency visits in older adults with chronic illness. a randomized, controlled trial of group visits. *Effect Clin Pract* 2001;4:49-57.

43. Simon GE, Manning WG, Katzelnick DJ, et al. Cost-effectiveness of systematic depression treatment for high utilizers of general medical care. *Arch Gen Psychiatry* 2001;58:181-7.

44. Cost-effectiveness of intensive v. standard case management for severe psychotic illness. UK700 case management trial. UK700 Group. *Br J Psychiatry* 2000;176:537-43.

45. Burns T, Fiander M, Kent A, et al. Effects of case-load size on the process of care of patients with severe psychotic illness. Report from the UK700 trial. *Br J Psychiatry* 2000;177:427-33.

46. Burns T, White I, Byford S, et al. Exposure to case management: relationships to patient characteristics and outcome. Report from the UK700 trial. *Br J Psychiatry* 2002;181:236-41.

47. Hassiotis A, Ukoumunne OC, Byford S, et al. Intellectual functioning and outcome of patients with severe psychotic illness randomised to intensive case management. Report from the UK700 trial. *Br J Psychiatry* 2001;178:166-71.

48. Essock SM, Mueser KT, Drake RE, et al. Comparison of ACT and standard case management for delivering integrated treatment for co-occurring disorders. *Psychiatr Serv* 2006;57:185-96.

49. Rich MW, Gray DB, Beckham V, et al. Effect of a multidisciplinary intervention on medication compliance in elderly patients with congestive heart failure. *Am J Med* 1996;101:270-6.

50. Rosenheck RA, Neale MS. Cost-effectiveness of intensive psychiatric community care for high users of inpatient services. *Arch Gen Psychiatry* 1998;55:459-66.