

A Collaborative Model for Delirium Detection and Early Intervention: A Five-Year Study

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Summary

Older persons with acute mental status changes and behavioral disturbances often present in the hospital emergency department and are subsequently admitted to an inpatient psychiatric unit. Without a comprehensive medical evaluation, the risk of morbidity and mortality from undetected medical conditions is increased. By collaborating with managed care organizations (MCOs), a managed behavioral healthcare organization (MBHO) developed and implemented an integrated approach for managing delirium prior to hospital admission.

Key Points

- A five-year case study shows a 283 percent increase in comprehensive medical evaluations completed in the decision-making process prior to an inpatient admission. Attention in the care-management process to the potential risks of undetected medical conditions in older persons can direct treatment to the appropriate level of care, either acute psychiatric or medical.
- The MBHO experienced a 23 percent reduction in cost per 1,000 member years, from \$5,859 in 2000 to \$4,492 in 2002, for the target diagnostic categories determined to be the most likely diagnoses for patients with undetected delirium. The cost benefit correlates to reduced utilization.
- Interventions included providing MBHO care managers with guidelines for escalating pre-certification decisions to a psychiatrist, training for care managers to identify persons at risk for delirium, implementation of a joint policy for the MBHO and MCOs on the care of persons at risk for delirium, and outreach to medical and behavioral health clinicians.
- A consumer-centered healthcare system has developed model processes to direct resources to meet consumer needs efficiently and effectively. An integrated approach to care allows clinicians to address the complexities of the differential diagnosis of behavioral and physical disorders in older persons.

WHEN THE DISTURBANCE OF AFFECT, behavior, and cognition become unmanageable, older persons with acute mental status changes often present to hospital emergency departments (EDs). However, differential diagnosis can be difficult. An accurate diagnosis is complicated by the absence of accurate medical and mental health histories and the timely transfer from the ED to an appropriate level of care. The consequence is under-detection of delirium and ineffective treatment, often marked by inappropriate admissions to inpatient psychiatric care.

Delirium, as defined by the American Psychiatric Association, is a disturbance in consciousness and

cognition not accounted for by a pre-existing or evolving dementia. Evidence from a history, physical, or laboratory tests attribute the cause of delirium to a general medical condition, substance intoxication or withdrawal, medication, or toxins.¹ Delirium is often undetected or misdiagnosed, or superimposed on existing illnesses, such as dementia.² Under-detection is associated with high rates of morbidity, prolonged hospitalization, and increased likelihood of an in-hospital death.³ These risks increase when diagnoses of chronic dementia, depression or psychotic illness hide an underlying causative physical or toxic disorder.^{4,5,6,7} In one ED study, 10 percent of persons

over 65 years of age were found with delirium; the ED physician positively identified only 35 percent of those.⁸ Another study of older persons diagnosed with depression and psychosis on a university geropsychiatric unit found 34 percent with unrecognized medical disorders.⁹

Successful management of medical conditions typically associated with delirium and prevention of adverse outcomes require early identification and intervention, particularly for persons being considered for placement in a psychiatric unit.^{6,10} Common contributors to misdiagnosis of delirium have been identified:¹¹

- failure to conduct an appropriate mental status evaluation
- intoxication with alcohol or illicit drugs
- inadequate physical examination
- failure to obtain available history
- failure to obtain indicated laboratory studies.

Processes for the differential diagnosis of delirium vary and lack standardization. An organized approach is recommended to discover symptom causes and in ordering appropriate laboratory studies.¹²

Although difficult to achieve, it is possible for multiple entities to work together on managing the process of care, reducing the potential for adverse outcomes with at-risk populations, and improving patient safety. Collaboration and coordination of the assessment and treatment for both behavioral health and physical health are critical. At the micro-level, clinicians involved in the day-to-day care management can implement comprehensive treatment strategies for persons with multiple and complex healthcare needs.

PacifiCare Behavioral Health (PBH) is a network model managed behavioral healthcare organization (MBHO). It administers behavioral health benefits for MCOs and employer-sponsored plans. One of its regional service centers manages benefits for three MCOs serving commercial and Medicare Advantage (formerly Medicare+Choice) enrollees in Washington and Oregon. In 1999, care managers in the regional service center provided anecdotal reports of undetected delirium in older persons. This resulted in longer lengths of stay in psychiatric units, transfers from psychiatric to medical units, increased morbidity, and, in some instances, death. Thorough assessment and triage of persons at-risk for co-morbid conditions became a priority. Seniors (age 65 years and older) enrolled in Medicare Advantage in 1999 represented 24 percent of the PBH region's membership, and accounted for 46 percent of all psychiatric inpatient days for commercial and Medicare enrollees. The region's experience was

disproportionate to the experience of the organization nationally, where Medicare enrollees represented 10.8 percent of the membership, and accounted for 14 percent of all psychiatric inpatient days.

PBH sought to improve collaboration with relevant medical delivery systems for persons presenting for inpatient psychiatric care, to ensure older persons with acute mental status or behavioral changes receive a comprehensive medical evaluation. Several avenues of system entry exist for a person seeking inpatient behavioral health services:

- Contact PBH via a toll-free telephone number for triage, pre-certification, and referral by a PBH care manager.
- Present at a network facility for triage and admission, if appropriate.
- Present in an emergency department for evaluation and referral.

In the latter scenario, a physician (e.g., the person's primary care physician, an emergency physician, or a psychiatrist) completes an assessment of the person's needs. A determination is made as to whether inpatient psychiatric care is indicated. For admission, a facility representative telephones PBH and requests pre-certification. The request is accompanied by a presentation of the patient's clinical disposition and is reviewed against utilization management criteria. When the person's clinical disposition satisfies criteria for admission to the level of care requested by the facility representative, care is pre-certified. The person's clinical disposition and rationale for pre-certification are documented in an electronic database. Considering several opportunities to reduce risk, PBH prioritized changes to its care-management processes, specifically at the point of entry into the behavioral health system.

Methods

Case study series were conducted over a five-year period (1999 to 2003). Using quantitative and qualitative data, the study evaluated PBH's processes for delivering acute inpatient psychiatric care to older persons at-risk for delirium and the effect of interventions intended to ensure timely detection and treatment for delirium. Baseline data were collected through case review. The case review determined the extent to which PBH care managers considered comprehensive medical evaluation of persons age 65 years and older in decisions about the level and setting of treatment. Using an internally developed audit tool, auditors examined individual case documentation. Audit tool criteria included information related to *medical*

history, physical, and laboratory studies. This permitted auditors to score each case record based on whether the spectrum of clinical information was considered in the certification decisions prior to a hospital admission. Cases including all three of these elements received a score of 1; those lacking any of these three elements received a score of 0.

At the baseline measurement, records were randomly selected from the database containing 230 records for persons age 65 years and older who were pre-certified for acute inpatient psychiatric care over a 12-month period. The sample was selected from the total number of claims for inpatient admissions for persons age 65 and older. A random number was assigned to each claim, and claims were sorted in ascending order by the randomly assigned numbers. The first 50 percent of the cases (n=115) were selected for case review. The sample size is sufficient to detect a modest effect size (approximately 10 percent) with a 0.05 significance level with a power of 0.8. Auditors were uniformly trained, provided with instructions on data collection, and tested for Inter-Rater reliability to ensure consistency. Confidentiality of Medicare beneficiary information was protected. Auditors were selected from the organization's clinical services staff, who had signed confidentiality agreements as a condition of employment. Subsequent measurements applied the same methodology.

Results

Evidence of the audit elements was found in only 17 percent of the cases at the baseline measurement. Qualitative analysis revealed barriers and opportunities for improvement in processes, both internal and external to PBH. Top-priority opportunities included:

1. Improve care manager review skills in assessment of risk for delirium.
2. Increase psychiatric consultation for care managers during pre-certification reviews.
3. Increase comprehensive medical evaluations by healthcare providers to rule out delirium for patients at risk.
4. Clarify delineation of responsibility between medical and behavioral health delivery systems in management of patients at risk for delirium.

PBH subsequently implemented training of its care managers. A 60-minute in-service training conducted by the PBH regional medical director, who was a board-certified geriatric psychiatrist, focused on identifying and managing patients at risk for delirium. Protocols for pre-certification reviews of older persons were added to the *Inpatient Care Manager's Escalation Guide* (Exhibit 1).

Training on specific clinical information required to rule out delirium was reiterated in the guide. This enabled inpatient care managers to determine when consultation was needed with the regional medical director. In consultation, the medical director advised whether evaluation was satisfactory or when additional evaluation was needed. The regional medical director facilitated outreach activities to medical providers, increasing their awareness of under-detected delirium and of the opportunity to collaborate with managed care for persons at risk.

A joint policy and procedure on the management of persons at-risk for delirium and dementia with agitation was developed and implemented with contracted health plans. Delineated were the procedures to be followed by both the PBH care managers and the medical delivery system to ensure effective treatment planning. Principal responsibility was placed on primary care physicians (PCPs), or an appropriate proxy, to complete a comprehensive medical evaluation to rule out delirium. In confirmed cases with delirium, treatment was arranged in a medical setting. Psychiatric consultation was pre-certified by PBH for medical settings as needed. Once the person presenting with delirium was medically stable and appropriate for ambulatory care, PBH facilitated ongoing psychiatric treatment to address cognitive disturbances or behavioral dyscontrol.

Remeasurement was conducted for the 12 months subsequent to the baseline period. There was a 15-percentage-point improvement in the medical evaluation completion rate over baseline to 32 percent. A Chi-square test showed the difference in rates for baseline to remeasurement was statistically significant ($\chi^2 = 6.34 [P \leq 0.025]$). Qualitative analysis underscored the need for more comprehensive training of PBH care managers in the steps of identifying at-risk individuals and ensuring delirium was ruled out.

External to PBH, opportunity remained for medical physicians to take initiative in conducting comprehensive medical evaluations to rule out delirium for at-risk persons. This was particularly true of PCPs who may not see the person. Often when hearing of acute changes in the person's mental status, PCPs would direct caregivers to the nearest ED to request a psychiatric admission. In response, the PBH regional medical director and clinical manager regularly presented the delirium protocol at meetings with MCOs and medical directors of contracted physician groups. In addition, the PBH regional medical director and clinical manager met with staff at psychiatric

hospitals to collaborate on procedures for managing older persons at risk for delirium. This intervention targeted hospitals serving a high-volume of PBH Medicare beneficiaries.

A second remeasurement was conducted for the 12-month period subsequent to the first remeasurement. Actions resulted in a 15-percentage-point improvement over the first remeasurement to 47 percent, a 176 percent relative change over the baseline. Comparing the first remeasurement to the second remeasurement, a Chi-square test demonstrated improvement of statistical significance ($\chi^2 = 6.82 [P \leq 0.01]$). Qualitative analysis concluded that comprehensive training was needed for newly hired care managers to ensure procedures to rule out delirium are consistently followed and considered in the process of patient placement. Also, additional interventions with physicians and the delivery system would support the efforts of care managers.

A third remeasurement was conducted for the next 12-month period. The result of 46 percent was not statistically significant from the second remeasurement ($\chi^2 = 0.028 [P \leq 1]$). Mapping the

process of pre-certification review for acute psychiatric inpatient care for older persons highlighted the lack of a standard tool or template to support care manager adherence to the defined procedures for inpatient pre-certification decisions. Modifying care management software to support this process was proposed as the greatest opportunity for improvement, but has not been implemented.

A fourth remeasurement was conducted for the next 12-month period. The result of 53 percent was not statistically significant over the previous measurement ($\chi^2 = 0.25 [P > 0.10]$). However, the result of this latest measurement represents a 283 percent increase ($\chi^2 = 25.34 [P \leq 0.001]$) over baseline in pre-certifications for inpatient psychiatric care, taking into consideration a comprehensive medical evaluation in the decision-making process. Improvement of performance over the third remeasurement, although not statistically significant, is attributed to recurring training of care managers to review history, physical, and laboratory studies in the pre-certification process for inpatient psychiatric care. Meaningful attention

Exhibit 1: Inpatient Care Manager's Escalation Guide

An Inpatient Care Manager Should Contact the Attending Physician Directly When:

- The facility's reviewer has inadequate clinical information and can't answer questions with sufficient detail. The issue is not necessarily whether inpatient care is necessary, but rather whether an appropriate treatment plan is being implemented. *Care managers shape appropriate treatment plans.*
- The facility's reviewer provides information that seems vague and untrustworthy. The concern is that the poor quality of information being provided may result in the consideration of a denial when the member's clinical status actually warrants inpatient care. *Care managers advocate necessary care for members and avoid unnecessary involvement by PBH medical directors as well as inappropriate denials.*
- The facility's reviewer is slow to respond. *Care managers work with the facility's utilization review staff as intermediaries for attending practitioners, ensuring that the practitioner is directly involved in the care management process when the intermediary is not cooperative.*

An Inpatient Care Manager Should Consult With a PBH Medical Director or Psychiatric Advisor When:

- Acute mental status changes suggest the possibility of delirium that is not being appropriately evaluated by the practitioner or facility; thus, a PBH psychiatrist is needed to review the general medical and psychiatric care provided to the member.
- Significant co-morbid medical conditions exist and a PBH psychiatrist is needed to assess the thoroughness of the diagnostic work-up and treatment planning for the member.
- Anorexia nervosa is the admission diagnosis.
- Autism or Pervasive Development Disorder is the admission diagnosis.
- Dementia is suspected or confirmed and appears to be the basis for the psychiatric symptoms being described.
- The member's detoxification protocol is unorthodox or it is not familiar to the care manager of clinical operations treatment, or it's a difficult case that has first been discussed with the team leader and it has been determined that review with a PBH psychiatrist is needed.
- Inpatient care has extended, and the case has not previously been presented to a PBH psychiatrist.

in the care-management process yielded identification of the potential risks of undetected medical conditions and early intervention with older persons presenting for acute psychiatric care. Exhibit 2 summarizes the methods and results for the five years. Exhibit 3 summarizes interventions.

There was an unanticipated cost benefit associated with this study. A retrospective cost analysis for inpatient psychiatric treatment for 2000 through

2002 was conducted using the entire population of inpatient service users age 65 and older. The data showed nearly a 23 percent reduction in cost per 1,000 member years, from \$5,859 in 2000 to \$4,492 in 2002 for the target diagnostic categories of dementia, depression not otherwise specified (NOS), and psychotic disorder NOS. These diagnoses are determined to be the most likely diagnoses for patients with undetected delirium. The cost benefit correlates

Exhibit 2: Completion Rates for Comprehensive Medical Evaluations

Period	Sample Size/ Total Population	Sampling Method	Results
1999	115/230	Simple random sample	17%
2000	117/234	Simple random sample	32% Baseline to Remeasurement 1: $\chi^2 = 6.34 [P \leq 0.025] \uparrow$
2001	161/321	Simple random sample	47% Remeasurement 1 to Remeasurement 2: $\chi^2 = 6.82 [P \leq 0.01] \uparrow$ Baseline to Remeasurement 2: $\chi^2 = 26.29 [P \leq 0.001] \uparrow$
2002	147/292	Simple random sample	46% Remeasurement 2 to Remeasurement 3: $\chi^2 = 0.028 [P \leq 1]$ Baseline to Remeasurement 3: $\chi^2 = 24.1 [P \leq 0.001] \uparrow$
2003	130/259	Simple random sample	53% Remeasurement 3 to Remeasurement 4: $\chi^2 = 0.25 [P > 0.10]$ Baseline to Remeasurement 4: $\chi^2 = 25.34 [P \leq 0.001] \uparrow$

*This sample size is sufficient to detect a modest effect size (approximately 10%) with a 0.05 significance level with a power of 0.8.

† The distribution is significant.

Exhibit 3: Key Interventions to Improve Comprehensive Medical Evaluation

- Protocol for management of delirium and dementia for use by PBH care managers
- *Medical Evaluation for All Members With Probable Delirium*, desktop guide for reviewing inpatient psychiatric admissions for older adults
- *Inpatient Care Manager Escalation Guide*. The desktop tool directs care managers to consult with the psychiatric physician consultant when acute mental status changes suggest the possibility of delirium.
- *Joint Policy on the Management of Delirium and Agitation Associated with Dementia* implemented with health plan medical groups by the health plan medical management teams
- Training of all care managers in PBH procedures for identifying and managing persons with delirium
- Delirium Protocol Training with in-network general psychiatric and geropsychiatric facilities
- Orientation to *Joint Policy on the Management of Delirium and Agitation Associated with Dementia* for 29 health plans' medical providers and representatives from medical groups. Materials included:
 - > Guidelines for a Comprehensive Medical Evaluation of Older Adults for Probable Delirium
 - > Rolodex card including the physician consultation service telephone number for consultation with a PBH psychiatric consultant
 - > Training of PBH care managers on laboratory studies that should be routinely requested for older adults presenting for acute psychiatric admissions to rule out medical conditions that may be causing psychiatric symptoms

to reduced utilization. In 2002, persons 65 years and older represented 28 percent of the PBH region's total membership, four percentage points more than in 1999, and utilized 20 percent of all psychiatric inpatient days, down from 46 percent in 1999.

Because this study was non-experimental, it is limited by the absence of case controls for any measurement, and there was no random assignment for the multiple interventions implemented by PBH. The mixing of effects may lead to the incorrect inferences about change in the rate of medical evaluations considered. However, healthcare providers are often at a disadvantage when conducting "research" in natural settings. It is not always possible or ethical to produce a true experimental, or even a quasi-experimental study design.

Discussion

A consumer-centered healthcare system models processes and directs resources to efficiently and effectively meet the needs of consumers. The result is an integrated approach to care, allowing clinicians to address the complexities of the differential diagnosis of behavioral and physical disorders in older persons. Effective interventions likely to make a difference include the adoption and implementation of clinical guidelines with the obligatory mental state examinations, steps for ruling out delirium during the initial assessment of acute mental status and behavioral changes, and training to increase clinical expertise in treatment planning for older persons.

Referenced existing research supports early identification and intervention as effective deterrents to increased morbidity and mortality. More research, advocacy, and action are needed in this area. As declared by the Institute of Medicine, healthcare is fragmented and the persons placed at greatest risk by insufficient coordination of care are those most in need of healthcare.¹³ Artificial and real divisions between healthcare disciplines and delivery systems—in particular behavioral and physical medicine—complicate diagnosis and create inefficiencies in the continuity and delivery of care that cannot be easily navigated or overcome by persons seeking care. Collaboration between MBHOs and MCOs can produce processes that ensure collaboration in the differential diagnosis and treatment planning for older persons, improving the integration of care needed to increase patient safety, reduce medical costs, and improve outcomes. **JMCM**

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