

## Special Article

# Joseph T. Freeman Award Lecture

## Comprehensive Geriatric Assessment: From Miracle to Reality

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**T**HANK you very much for this great honor. I am really pleased to have been selected by my colleagues for this award and to join a long list of past Freeman awardees, many of whom were my own wonderful mentors and senior faculty members, such as David Solomon and John Beck, as well as noted friends and colleagues, including Frank Williams, Bob Butler, Jack Rowe, Chris Cassel, Knight Steel, Evan Calkins, Reubin Andres, Richard Besdine, Isadore Rossman, Lissy Jarvik, Harvey Cohen, Bill Hazzard, Mary Tinetti, and Bob Luchi. (Maybe I magically thought by dropping their names, some of their wisdom and poise might rub off on my own words today!)

Who was Dr. Joseph Freeman? He was a past president of the Gerontological Society of America (GSA) and an internist with a pioneering interest in the health problems of older adults. He authored some of the earliest geriatrics textbooks, including *Clinical Principles and Drugs in the Aging* in 1963 and *Clinical Features of the Older Patient* in 1965. He chaired the internal medicine section of the first White House Conference on Aging in 1961, and was on the faculty of the Medical College of Pennsylvania for over 20 years. The Clinical Medicine Section of GSA established the Freeman Award lectureship in 1977 with an endowment to honor Dr. Freeman. Dr. Freeman lived several more years and was actually able to attend some of these lectures. He practiced medicine until his death in 1989 at age 81.

My topic today is “Comprehensive Geriatric Assessment: From Miracle to Reality.” I’ll try to give an overview of the concept of comprehensive geriatric assessment (CGA), its history as a central guiding principle of geriatrics, its rationale, and research evidence for its effectiveness—spanning the earliest single-site trials to the more recent multi-site trials. In the process, I’ll try to give my perspective on some of the key aspects of CGA and why the effectiveness data seems to have varied between trials and over the years. My hope is that key elements will emerge that are signals to guide future development. Recognition of these elements will insure the continued usefulness and cost effectiveness of CGA as an important tool for improving care of frail elders.

I was really fortunate to have entered geriatric medicine on the ground floor (or maybe the second floor), at a time when there was almost a limitless amount to discover and study. The field was new, and the potential areas of research were just beginning to be scoped out and studied rigorously. People thought I was somewhat weird to be going into geriatrics then. After all, who would want to specialize in people who were often felt to be the “least desirable” of patients—patients with short life expectancies, little disposable income, often demanding and difficult to communicate with, and usually with difficult-to-understand complex and interacting medical problems? Well, people probably still think that I’m weird, but the field of geriatrics has matured and become at least *almost* respectable. It has become eminently clear that our field has developed a truly scientific and effective way for treating complex elderly patients that improves their outcomes and increases their quantity and quality of life.

When I entered geriatrics back in 1979 after my Robert Wood Johnson fellowship, my first boss was Itamar Abrass, who put me in charge of a brand new inpatient geriatrics unit at the Sepulveda Veterans Administration (VA) hospital—we called it the geriatric evaluation unit (GEU). I worked there together with our first fellows (many of whom have gone on to major leadership careers in geriatric medicine) and with rotating attending coverage from senior geriatric faculty members such as Dave Solomon, John Beck, Bob Kane, and John Morley. The Sepulveda GEU was based on similar units existing in the United Kingdom where complex older patients could be assessed, treated, and given rehabilitation in a specialized clinical and educational setting. These units were widely used, but never tested for their effectiveness. Most physicians in the U.K. felt that geriatric units were important and effective, but without data, it seemed that the concept would be a hard sell in mainstream U.S. medicine.

An exception to the general reluctance in the United States to consider geriatrics services was the VA where the geriatric imperative was appearing well before it had begun to in the rest of the medical care establishment. The VA anticipated the

premature graying of its population and, under the leadership of Drs. Paul Haber and Ralph Goldman, established the system of Geriatric Research, Education and Clinical Centers (GRECCs) in the mid-1970s to create a cadre of clinicians, educators, and researchers ready to face the onslaught of older veterans. (As an aside, this is another example of the foresight and largely unsung creativity of the VA—analogueous to its more recent outstanding and innovative computerized medical record systems, quality assurance programs, and multi-branched research programs—indicating how the VA has anticipated the special needs of its economically and physically challenged patient population.)

Before going on to specifics of what we found on our unit and subsequent research, let's back up just a bit to define a few aspects of comprehensive geriatric assessment. CGA has been defined in both long and short definitions. A brief definition that I favor, which seems to capture the major elements with a minimum of words is: CGA is a multi-dimensional, interdisciplinary, diagnostic process to identify care needs, plan care, and improve outcomes of frail older people. The major purposes of CGA are to improve diagnostic accuracy, optimize medical treatment, improve medical outcomes (including functional status and quality of life), optimize living location, minimize unnecessary service use, and arrange long-term case management. CGA has a number of major measurable dimensions, usually grouped into the four domains of physical health (including the traditional history, physical examination, laboratory data and problem list, disease-specific severity indicators, and preventive health practices), functional status (including activities of daily living [ADL], instrumental activities of daily living [IADL], and other functional scales such as mobility and quality of life), psychological health (including mainly cognitive and affective status), and socioenvironmental parameters (such as social networks and supports, and environmental safety, adequacy, and needs). CGA can be performed in a number of places (such as hospital, home, and nursing home) and with varying program types and levels of intensity (such as hospital GEUs, hospital acute care for elderly [ACE] units, hospital consultation teams, outpatient brief screening assessment programs, or intensive in-home assessment and case management programs). But wherever it is performed, CGA is at the hub of the geriatric care system, serving as a common language, a set of guideposts, a method of gate-keeping, and in fact the foundation for everything we do in geriatrics.

Historically, CGA programs have gone through three main phases of development. The mid-1930s through about 1975 was the phase of early conceptualization and model development. The beginning of this period saw the development of geriatric assessment concepts in workhouse infirmaries of the U.K. when Marjory Warren and other pioneering physicians with interests in geriatrics discovered that most of these long institutionalized and mostly bedfast patients had multiple undiagnosed conditions that could be treated and rehabilitated, often raising their levels of independence and in many cases returning them to the community. Their papers relating these experiences were glowing, but all were descriptive and anecdotal. When the British National Health Service was founded in 1948,

geriatric medicine was accorded full specialty status, so impressive were the reports of the pioneering geriatricians, and geriatrics units were mandated in each health district in the country. This period also saw the founding and initial development of the geriatric and gerontological societies, all of which advocated research on and improved care for older adults. The end of this first period saw the first major development in geriatrics in the U.S., the establishment of the system of VA GRECCs, to be centers of excellence for research, education, and clinical demonstration programs in geriatric medicine.

From 1975 through about 1995 was the period of refinement and testing of clinical geriatric models, specifically those based on CGA. An extended series of randomized controlled trials (RCTs) were performed, culminating in a formal meta-analysis of 28 RCTs in 1993. Major policy statements from professional societies, task force white papers, and consensus reports were produced, extolling the importance of CGA as a major and effective central part of geriatric care. These included the consensus development conferences from the National Institutes of Health in 1983 and 1987 (1); the specialty white papers produced independently by the American Geriatrics Society, the American College of Physicians, and the Society for General Internal Medicine all in 1988; and the International State of the Art conferences in Sweden (2) and Italy (3), in 1988 and 1994, respectively.

From 1995 to the present day has been the period of mainstream integration and consolidation. Principles of geriatrics have entered the mainstream of health care, thanks to a substantial extent to the diligent efforts of geriatricians and geriatric educators, and the standard of care for older adults has shown consistent improvement. Models of chronic disease care management have emerged, largely based on CGA principles. Uniform patient care databases have emerged, such as the Minimum Data Set and Resident Assessment Inventory. Multi-site "effectiveness" trials of CGA programs have been performed to test the results of the single-site trials, and these have raised new questions of the optimal roles and sites for CGA programs and which patients are most likely to benefit.

But returning to the narrative, why should we do CGA? Among the main reasons has been the presence of much undiscovered treatable disease and disability among the older population, large amounts of premature and otherwise avoidable nursing home admissions, a widespread neglect of rehabilitation needs, rampant drug-related excesses, and other iatrogenic problems among older people. But the bottom line is that CGA programs improve outcomes. And over the years, many major outcome improvements have been shown to arise from CGA programs, including improved accuracy of diagnosis, better patient functioning and living locations, improved affect and cognitive status, more appropriate medication use, reduced use of hospitals and nursing homes with resultant cost savings, and reduced mortality rates. I'll go into these in more detail now.

Let's go back to our original Sepulveda GEU experiences. A very short time after beginning to work on the GEU, it became clear to me that something worthwhile was happening. We kept simple before and after records of

diagnoses, medications, physical function, and anticipated versus actual discharge locations in an attempt to understand how our patients were faring. We suspected that the comprehensive assessment, treatment, and rehabilitation by the interdisciplinary team were having some good effects, but such benefits had yet to be shown. After looking at our pre-post data books, it was apparent that, in fact, we were finding lots of previously unmade diagnoses (about 1 major and 3 to 4 minor diagnoses per patient), reducing unnecessary medications, improving physical function as measured by ADL and IADL, and improving discharge location over what had been anticipated. We published these observational findings in 1980 (4). But knowing that pre-post data cannot prove causality, I requested funds (with Itamar's encouragement) from VA Health Services Research and Development Service to undertake an RCT of the unit in which eligible patients would be randomized to either enter the GEU or continue to get their usual hospital care. After completing the first year of follow-up on 123 randomized patients, we were amazed to find that not only did the randomized trial results confirm the pre-post data, in comparison with the control group (i.e., increased diagnoses, improved function, reduced nursing home placement), but new and unanticipated outcomes were shown—notably reduced mortality, reduced rehospitalization rates, reduced cost, and improved high functioning survival—which were findings only a controlled trial could detect. These data were published in 1984 (5) and immediately were greeted with great interest, as well as some skepticism. After all, how could such a simple concept—taking extra time and interest to figure out and manage the special needs of these high-risk patients—produce such dramatic benefits and save money at the same time?

Fortunately, it wasn't only our study that showed these benefits. A whole series of controlled trials of CGA programs in a wide variety of settings (hospital, outpatient, home visit) began appearing in print, and most were confirmatory of significant benefits. For example, a little after the Sepulveda GEU trial, Bill Applegate published his controlled trial of a GEU in a private U.S. rehabilitation hospital, and found similar effects outside the VA (6). Not all trials showed the same spectrum of benefits—as might be anticipated, the more intensive and longer-term interventions seemed to provide substantially more benefit than the one-time consultation or outpatient visit programs.

The home was another early site for testing CGA, using visiting interdisciplinary teams. For example, about the same time our RCT was published, Carsten Hendricksen's Danish study of quarterly home visits for CGA and follow-up appeared, with very similar effects on improved survival, reduced hospitalization and nursing home use, and improved function (7).

Over the next dozen years, at least 32 controlled trials were performed and published. They took place in countries all around the world, including Canada, Britain, Australia, Sweden, Denmark, Italy, Finland, and the United States. Programs evaluated included hospital inpatient units (e.g., GEUs, geriatric evaluation and management [GEM] units, ACE units, geriatric rehabilitation units), hospital consultation teams, home visit assessment and management programs, and outpatient clinic assessment programs. Documented

impacts of the programs varied considerably, but the great majority of them showed major intervention benefits such as improved survival, improved function, reduced nursing home days, and improved costs. Others showed fewer significant benefits, but all except 3 studies showed some significant patient outcome improvement. In qualitatively comparing the studies with greater and lesser benefits, it seemed apparent that, among hospital studies, the programs with higher benefit were those that more carefully targeted frail patients with complex geriatric problems and those that provided more hands-on care, rather than simple consultation. Among outpatient and home visit studies, the programs with higher benefit were those that included multiple follow-up visits and hands-on care from the team. To summarize generally across programs, the factors associated with higher patient benefit seemed to be targeting patients most in need, having clinical control of care (rather than only consultation), having multiple follow-up visits, and having a higher intensity intervention.

While all these studies were going on, the concepts of CGA were expanding worldwide. Those of us in the field were constantly being asked to speak about the structures and outcomes of CGA programs. It was very exciting playing a role in developing geriatric systems in other countries as a senior advisor particularly in Europe, Asia, and Latin America.

In 1992, we were fortunate to have the Swiss geriatrician Andreas Stuck with us on his sabbatical, and were able to perform a number of excellent collaborative projects. One was a systematic meta-analysis of the CGA study literature though 1993, then including 28 RCTs grouped across 5 general types—hospital GEM units, hospital consultation teams, home assessment programs, post-hospital home assessment programs, and outpatient assessment services. The meta-analysis confirmed many of the qualitative conclusions already made, but was able to do so more quantitatively. Some types of programs had more benefit than others, particularly the inpatient units and the home CGA teams. Across all programs, there was an 18% reduced mortality risk for patients in the CGA programs, a 25% increased likelihood of living at home at follow-up, a 41% increased chance of cognitive improvement, and overall a 12% reduced risk of hospitalization for intervention patients. Functional improvement was only significant for patients in the inpatient GEM units (8).

After the meta-analysis, studies continued to be published, focusing on questions relating to what components of the intervention were most effective and how the CGA process could be streamlined to make it less intensive and costly. Some authors focused on the discrepancies between studies and their results, and others on the common conclusions. In 2000 and 2001, there were two new literature syntheses of home visit assessment studies. One by van Haastregt focused on the apparent discrepancies between study methods and results and concluded the evidence was not hard enough for firm conclusions (9). Another by Elkan, using formal techniques to pool the data, showed a "high level of evidence" (10). That year, Andreas Stuck updated our prior meta-analysis to include the new studies on home visit CGA programs, and he performed a meta-regression

analysis to try to find program elements associated with greater benefit (11). As covariates, he examined the presence of targeting, the number of follow-up visits, and use of an intense CGA process. He found that the number of follow-up visits in the program was very related to the program success in reducing nursing home admission. He also found that the effectiveness of the program in reducing functional decline was very related to the presence of an intense CGA and follow-up process. These comparative analyses confirmed an important observation made before: CGA programs need to be targeted to the right patient subgroups. Overall, the CGA studies support several recommendations. In general, for frail and high-risk elderly patients, especially those recently hospitalized and those being considered for long-term care, a tailored CGA and follow-up program is appropriate. For elders at medium risk, or for those aged 75 years and older without chronic illness, a preventive home visit CGA and follow-up program is appropriate. For elders at low risk, a program of periodic health risk appraisals, conducted through primary care or in tandem with primary care, is appropriate.

Despite this relatively consistent body of data documenting the many benefits of CGA and follow-up programs, the road to expansion and general acceptance of this approach has not been a smooth or straight one. Sometimes the real world has unpleasant surprises. For example, soon after the first controlled trials were showing effectiveness of these programs and they had begun to proliferate widely, Medicare introduced the prospective payment diagnosis-related groups (DRG) program. Suddenly, a hospital unit that did anything that increased length of stay was immediately unprofitable—even if it could recover costs later by reduced rehospitalizations or nursing home admissions. In fact, with the DRG system, multiple hospitalizations to evaluate multiple or complex problems were preferable financially to the institution than were more efficient, though possibly longer, single hospitalizations. The GEU concept still made sense financially in capitated systems such as health maintenance organizations or the VA, and the VA pushed hard to establish a GEU or GEM programs in every VA medical center (12), but GEM unit growth in the fee-for-service sector essentially stopped. Even the natural world seemed to put up barriers. A shock for the original GEM unit at Sepulveda was the Northridge earthquake of 1994, which closed our Sepulveda inpatient hospital along with its GEM unit.

Another damper on GEM expansion has been that some clinical trials have not shown dramatic benefits. As with many technologies, research often has various interpretations, and even when the evidence seems to support the clearest of conclusions based on data from single sites, multi-site trial results are often less convincing. The results of the long-anticipated VA cooperative inpatient-outpatient GEM trial by Harvey Cohen and colleagues, for example, were somewhat disappointing (13). In that carefully designed multi-site cross-over factorial study, almost 1400 hospitalized elders were randomly assigned to 1 of 4 groups across 11 VA medical centers with established geriatrics programs. Patients either were assigned to the inpatient GEM unit or to usual inpatient care with either usual outpatient follow-up or geriatric clinic follow-up. At the end

of the 1-year follow-up period, there were no differences in survival between groups (about 78% overall survived). There was a short-term functional improvement for the GEM unit patients and a mental health improvement in the geriatric clinic follow-up patients, but no dramatic effects. Yet, before we conclude that CGA is somehow no longer effective, we need to examine the study limitations carefully. First of all, the careful cross-over factorial design may have affected the way care was delivered on the GEM units, since the teams did not know until after discharge whether or not they would be following-up on their patients, and they may well have kept all patients in hospital longer than they would have otherwise to protect against the possibility of patients not receiving optimal outpatient follow-up. Second, all the sites had well-established geriatrics care and teaching programs for years, and the control group care may thus have been considerably better than at sites without such programs. (This is something we have definitely observed over time—older patients nowadays in our medical centers are definitely getting better care than they used to, in terms of diagnostic accuracy, medication use, and general awareness of geriatric medicine and principles.) The 78% 1-year control group survival was quite a bit higher than seen in most earlier inpatient GEM trials, which is consistent with this trend. Elimination of GEM units at these sites, however, could reverse this progress if the GEM is in essence providing educational outreach.

Third, simply being in a cooperative multi-site trial with central control of patient selection, randomization, and data collection may well have affected the way care was delivered, taking some normal clinical decision-making away from local teams. Cooperative studies work well for drug trials when there is a single, clear-cut intervention to be studied, but may not work as well for complex interventions. Be that as it may, we can certainly learn a lot from the Cohen study—disappointed as I was personally by its less-than-dramatic results.

There have been other recent studies as well, and more are still being done. One published last year from Norway of an acute hospital GEM unit showed significant effects on survival for acutely ill elders randomized to the unit (14).

My reading of the many studies, with their variety of program types and outcomes, is that there are clear reasons why some trials have shown more positive effects than others. They relate both to study design issues and to intervention issues. Some design features commonly seen in negative trials include insufficient sample sizes, imprecise entry criteria, or insensitive outcome measures. Some negative trials have also suffered from a weak intervention or nonimplementation of consultation advice. Not all studies have agreed on what constitutes CGA. And, finally, recent studies are subject to the growing—and certainly positive overall—phenomenon of improving geriatric care trends, which tend to be particularly prevalent in the places most likely to participate in these types of studies.

So what have we learned from these studies about effective geriatric care? Clearly CGA is an important tool for focusing diagnostic knowledge and care resources on frail, complicated elderly patients. It can be extremely effective in raising the level of care, and fortunately it has

become integrated into virtually everything we do in geriatrics. But it is also important for us not to oversell it or to disseminate it in such a way as to waste its energies on patients who do not need it. We know that some kinds of CGA-based programs are not so effective, due to watered-down intervention strength, inadequate follow-up, or poor targeting. Examples of these would be consultation teams that deliver only unsolicited consultative advice without substantial hand-on care or follow-up, or outpatient CGA programs with limited visits and inadequate follow-up. It is important to tailor the right level of intervention to the right population subgroup. As mentioned earlier, for most healthy elders, primary care medicine with periodic attention to preventive activities (such as exercise, nutrition, and health risk appraisal) is probably adequate. For frail, acutely ill, and elders being considered for long-term care, a more systematic CGA and follow-up approach is important to ensure that their needs are assessed and met. For intermediate groups, programs of periodic in-home CGA and follow-up have been shown to be effective.

Some important principles to keep in mind in improving geriatric effectiveness and cost efficiency include targeting the right intervention to the right patient, streamlining the CGA approach, helping to identify the CGA-related cost-savings from reduced hospitalizations and nursing home stays so as to “incentivize” the CGA process, and finally to ensure an integrated follow-up/case-management system to make sure that patient are not falling between the cracks.

In closing, there are a number of important directions for further research in this area. These include testing streamlined models of post-hospitalization CGA programs in nursing homes or home care settings; devising accounting methods for recapturing cost savings from avoided hospital and nursing home days and using these funds to cover CGA expenses, testing “unbundling” strategies to document use of multiple care processes within the CGA, validating common computerized databases for CGA that would be usable across care settings, and testing innovative ways to fully consolidate CGA with the chronic disease care model. All of these activities will help to define the optimal roles of geriatric medicine—hopefully in time to help the baby boomers like me!

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