

CareManagement

OFFICIAL JOURNAL OF THE ACADEMY OF CERTIFIED CASE MANAGERS

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By Sharon Silow-Carroll, MSW, MBA, and
Gretchen Hagelow, MPA

The authors have examined programs in five states that refer and coordinate care for children and families identified with early developmental delays, complex medical conditions, and difficulties negotiating the medical and related support systems. In addition to referring families to appropriate community or state programs, helping to coordinate their care, and providing support and follow-up to ensure they receive needed services, these programs provide an important feedback loop to primary care providers. Features that help make these programs successful include maximizing efficiencies through shared resources, leveraging and partnering with other organizations, in-depth involvement with pediatric practice staff, appropriate training and tools, flexible program design, measurement and evaluation, and a holistic approach to care.

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Geisinger Health Plan successfully used a predictive modeling tool to streamline its case management programs for at-risk patients and support its Medical Home. Read about the use of predictive modeling to identify those patients who are at greater risk for selected current and future health problems. After at-risk patients are identified, disease management programs can be designed to promote greater self-care, improve adherence to treatments, and engage case managers and other health care practitioners in following patients more closely—all in an effort to improve outcomes.

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Gary S. Wolfe



Technology and *CareManagement*

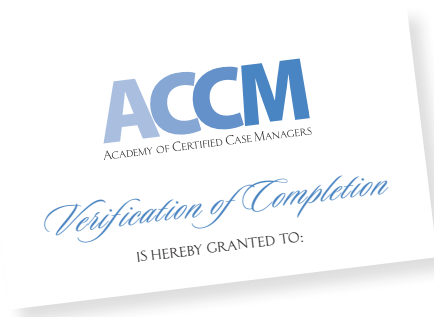
I am delighted to report two new developments at *CareManagement*, both using technology.

You can now be connected to *CareManagement* using LinkedIn. Just go to LinkedIn.com and search for *CareManagement*. Then join the group. LinkedIn has over 100 million members and is the largest listing of professionals. Social networking has come of age. LinkedIn is one way to manage your professional identity. You can build and engage with your professional network. You can access knowledge, insight, and opportunities. It really makes staying in touch simple. Join the *CareManagement* network, which is full of industry experts who are willing to share advice.

By being "linked in," you will be the first to know what articles will appear in the next issue of *CareManagement*. You can raise questions, seek advice, and challenge an author. Using LinkedIn, you can also tell me what you would like to read in *CareManagement*. What knowledge do you seek? What is your biggest challenge that you need help with? Your *CareManagement* network can help. The success of our network depends on your joining in.

In a future issue of *CareManagement*, we would like to have our editorial board and other experts help answer some of your questions related to ethical issues you face in your everyday work. By joining our LinkedIn group, you can post questions about ethical issues. We will gather these questions and find thoughtful answers from experienced case managers to help create continuing education articles that will be more valuable to you.

Our other exciting announcement is that our self-study examinations are now available online. Go to www.academyccm.org and follow the menu to *CareManagement*. You can take the examination and if you pass, you can print out your continuing education certificate. You have two chances to pass the examination before you will be



locked out and then you must mail in your test results. For now, the examinations online will be only for certified case managers. In time, we may expand for certified disability management specialists.

Both of these developments have been made to better serve our members.

Join LinkedIn and let me hear from you.

Gary S. Wolfe, RN, CCM
Editor-in-Chief
GSWolfe@aol.com

ACCM: Improving Case Management Practice through Education

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Transitions Key to Success of Program for Adults With Autism Spectrum Disorder

CARF's Employment and Community Services division began has been collecting exemplary practices of programs in the community for publication as Promising Practices articles. The following is one example of such a practice.

Midwest Special Services, Inc.

With 60 years of experience serving people with a wide range of disabilities, Midwest Special Services, Inc. (MSS), located in the Twin Cities area of Minnesota, knew a thing or two about what worked when it came to producing positive outcomes for clients in a traditional day program setting. However, when Dakota County Human Services approached the organization about developing a program for adults with autism, it was time to put aside tradition and focus on the specific and unique challenges faced by this population. Thus began the Autism Spectrum Disorders (ASD) Program for Adults, the first CARF-accredited autism program in Minnesota and only the second in the country.

The ASD program began in a small program room out of MSS' Burnsville, Minnesota, center, and, within a year, plans were underway to build a new facility. It had to meet the needs of both the ASD and traditional programs. The new site, located in Apple Valley, Minnesota, was designed with the specialized needs of people with ASD in mind, paying close attention to items that many adults with ASD struggled with on a daily basis, such as sensory issues, distraction levels, and difficulty with transitions.

Sensory needs are addressed daily in many formats: a large gymnasium provides opportunities for gross motor activities, such as bowling, swinging, and

other active games; a multisensory room provides opportunities for relaxation or stimulation of all the senses; the garden room encourages hands-on gardening, enjoying the smell of fresh herbs or the gentle hum of a hydroponic system; therapy balls replace chairs in many rooms for individuals who prefer bouncing to sitting; and small sensory bins are accessible for each person, depending on his or her individual sensory needs or preferences. Program rooms were designed to provide minimal distractions, including limiting or omitting windows and equipping rooms with dimmer switches to control lighting that may be distracting to some.

Key to the program's success is the emphasis on facilitating transitions.

Transitions are built into each day, and all individuals transition through many different rooms/activities throughout the day, including a variety of community-based work/volunteer and leisure/recreation activities. Transitions occur every 30 minutes and are preceded by auditory and visual cues, which allow individuals to prepare for the upcoming change. This process has facilitated easier transitions during the program day and has reportedly impacted the home lives of these individuals as well. Several families have reported that they have noticed an increased tolerance to change, as well as more flexibility in daily routines, attributing these skills to the number and frequency of transitions that occur

during the program day.

Everyone in the program works closely with the staff to set up a daily picture schedule, outlining where and when transitions will happen and any other activities or outings that may occur. Social stories are available to assist with difficult situations, and "All About Me" books are written for each person in the program, outlining things such as likes and dislikes, behavioral triggers, and communication barriers.

All staff members receive extensive training on ASD-related topics, and a resource binder is available for staff to learn about the many aspects and complications of ASD. For a little added inspiration, it includes news stories/articles about people with ASD doing extraordinary things. A resource binder also exists for families and individuals with ASD, providing information and contacts on topics such as advocacy, medical specialists who work specifically with individuals with ASD, and many other services. A parent support group meets monthly, and picnics and gatherings are held throughout the year to allow families to connect, network, and share additional resources with each other.

Although intense, the organization and structure of the ASD service delivery model have been a great success. Individuals in the program and their families have reported positive changes and growth since the program began. The program was recently expanded to

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Revised Standards of Practice for Case Management: Ethical Issues

By Elizabeth E. Hogue, Esq.

Standards governing the practice of case management were first published in 1995 by the Case Management Society of America (CMSA). The Standards were revised for the first time in 2002 and again in 2010. This is the fifth in a series of articles about the legal and ethical implications of the Standards revised in 2010.

With regard to ethics, the revised Standards provide that:

Case managers should behave and practice ethically, adhering to the tenets of the code of ethics that underlies his/her professional credential (eg, nursing, social work, rehabilitation counseling, etc.).

Demonstrating Adherence

Case managers demonstrate adherence through:

- Awareness of the five basic ethical principles and how they are applied: beneficence (to do good), nonmaleficence (to do no harm), autonomy (to respect individuals' rights to make their own decisions), justice (to treat others fairly), and fidelity (to follow through and keep promises)
- Recognition that a case manager's primary obligation is to his/her clients
- Maintenance of respectful relationships with coworkers, employers, and other professionals
- Recognition that laws, rules, policies, insurance benefits, and regulations

Elizabeth E. Hogue is a health care attorney and consultant in Washington, DC.

are sometimes in conflict with ethical principles. In such situations, case managers are bound to address such conflicts to the best of their abilities and/or seek appropriate consultation.

Autonomy

Case managers and discharge planners have a special obligation with regard to the ethical principle of autonomy when patients are ready to exercise their rights to choose postacute providers. The ethical principle of autonomy requires case managers and discharge planners to provide information to patients so that they can make decisions for themselves and act on those decisions.

Applying this ethical principle to the process of discharge planning from hospitals, it is clear that applicable statutes and regulations require case managers and discharge planners to present lists of skilled nursing facilities (SNFs) and home health agencies (HHAs) to patients so that they can make autonomous choices. Hospitals are also likely required to present lists of hospices to patients.

A "neutral presentation" of the list that recognizes patients' right to autonomy means that discharge planners and case managers take the list described above to patients' rooms and say something like the following (and nothing else that may persuade patients to choose particular agencies):

"You have the right to choose the provider that you would like to have provide services to you. Here is a list

of providers that render services in the area in which you reside."

If, in response, the patient chooses a provider, then the case manager or discharge planner may not try to dissuade the patient or make negative comments about the choice. The only response the case manager should make to the patient who has made a choice must be either "Yes, Ma'am" or "Yes, Sir."

If the patient says he or she cannot choose, the case managers must assist the patient to do so. Case managers and discharge planners, however, do not ever make choices for patients. Instead, they may help the patient to choose by saying something like the following:

"As you can see from the list, our hospital owns this hospice. Perhaps you would like to choose this one."

"Our hospital has a preferred provider relationship with this provider. Perhaps you would like to choose this one."

"This provider has a specialty program in orthopedics, which will be the focus of the services you need, so perhaps you would like to choose it."

Patients are likely to adopt the suggestions of case managers and discharge planners under these circumstances. There is a clear difference, however, between choosing for patients, which case managers and discharge planners cannot do, and assisting patients with making informed choices. Case managers must never lose sight of the fact that patients are in the drivers'

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The Role of the Professional Case Manager in New Models of Care Delivery

By **Patrice Sminkey, RN** *Chief Staff Executive, Commission for Case Manager Certification*

See page 31 for details about the CCMC/ACCM “Get a Candidate Campaign” contest!

For professional case managers, delivery of care is accomplished through a network of resources. Whether case managers work in a hospital or other acute-care setting, for an insurer or third-party provider, or in another venue, identifying the appropriate resources is at the heart of advocacy for patients. Now, as new models of care delivery continue to emerge, the professional case manager—particularly one who is board-certified—will be at the heart of these networks to coordinate care, facilitate communication, and employ evidence-based practice in pursuit of positive outcomes.¹

In the era of health care reform, health care organizations, clinicians, and practitioners are pursuing continuous improvements in quality, efficacy, and efficiency. Among the models that have emerged is the patient-centered medical home (PCMH), which is led by the primary care community. The PCMH is a model of care delivery that requires a primary care physician to achieve a critical balance of clinical and administrative resources, all the while recognizing Medicare reimbursement policies that put greater emphasis on outcomes.

Patrice Sminkey, RN, is the Chief Staff Executive of the Commission for Case Manager Certification (www.CCMCcertification.org), which is the first and largest nationally accredited organization that has board-certified more than 30,000 professional case managers.

Amid these new complexities in care delivery, primary care physicians must either try to do everything themselves—which while effective, is not efficient—or they must hire case managers whose roles and responsibilities are integrated into the PCMH. Therein lies the challenge for primary care physicians, who may not be familiar with the roles and functions of a case manager. Physicians who have limited knowledge of case management could erroneously utilize nonclinical staff for case management duties. Although nonclinical staff can be used for duties such as paperwork processing, use of these individuals to address patient needs is inappropriate and could expose the physician to liability.

The roles and function of case management must be performed by a professional case manager, preferably one who is board certified. The Commission for Case Manager Certification (CCMC), which has board-certified more than 30,000 case managers, defines case management as “a collaborative process that assesses, plans, implements, coordinates, monitors, and evaluates the options and services required to meet the client’s health and human services needs.”²

The CCMC’s most recent case management role and function study, which involved scientifically conducted field research with nearly 7,000 participants, identified and evaluated essential activities of case management, including

case management process and services, resource utilization and management, psychosocial and economic support, rehabilitation, outcomes, and ethical and legal practice. Knowledge domains identified from the study were case management concepts, health care management and delivery, principles of practice, psychosocial aspects, health care reimbursement, and rehabilitation. As an analysis of the study concluded, “...the activities and required knowledge will put case managers in an excellent position to distinguish themselves through certification as competent professionals who are able to contribute to the health and well-being of clients/patients, and the overall efficiency and efficacy of the health care system.”³

Given this thorough analysis of case management—what professional case managers do and the knowledge that is required of them—it is only logical that new models of care such as PCMH would utilize best-in-class case management in the pursuit of quality, efficiency, and efficacy goals. Through board-certification, such as achievement of the Certified Case Manager (CCM) credential, professional case managers attest to their competence, professionalism, adherence to ethical standards, and commitment to pursue continuing education, which is required for certification renewal.

The care coordination component within new models of delivery such as

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Paying It Forward Through Mentoring

By **Carla Rea DeFlorio, CAE** CEO, Certification of Disability Management Specialists Commission

In disability management, in which skills are acquired largely on the job, pathways must be established for talented young professionals.

Every experienced disability manager therefore has an obligation to share what he or she knows with those who are entering the field. This outreach can be accomplished in many ways: speaking at conferences, teaching a workshop, and acting as a mentor.

Mentoring is more important than ever in disability management. As research from the Certification of Disability Management Specialists Commission has shown, the roles and functions of disability managers have expanded significantly in recent years. Today, the practice of disability management spans four areas, or domains: disability and work interruption case management; workplace intervention for disability prevention; program development, management, and evaluation; and employment leaves and benefits administration.

New entrants into disability management, as well as those who have been practicing mostly in one or two areas, now face additional demands. Mentoring helps to navigate the field and identify resources for understanding such things as the Americans with Disabilities Act Amendments and Family and Medical Leave Act, as well as new developments in health, wellness, and productivity.

Carla Rea DeFlorio, CAE, is the CEO of the Certification of Disability Management Specialists Commission (www.CDMS.org), which is the only nationally accredited organization that certifies disability management specialists.

The mentoring relationship can be established within a company or across organizations. Key mentoring actions to facilitate this relationship include:

- Finding and reaching out to an informal or formal mentor who is willing to advocate for the mentee, including for his or her upward mobility within an industry or organization
- Identifying the informal rules of the industry or field
- Learning to better navigate the unwritten rules and political aspects of the job
- Building a set of self-management skills, including the ability to overcome roadblocks

Mentoring is a highly effective,

For the mentor, the relationship helps to build leadership skills that can advance one's own career.

interpersonal process that benefits all parties. Both the mentor and the mentee are challenged to stretch and grow in their experiences. Through this personal connection, knowledge and wisdom are shared. Mentees gain valuable advice, develop knowledge and skills, improve their communication, learn new perspectives, build their networks, and advance their careers. Mentees also learn best practices related to employer demands and the needs of employees who are ill or injured or who have a disability.

For the mentors, the relationship helps to build leadership skills that can advance their own career. In addition,

the mentor gains the satisfaction of giving back to a field in which he or she most likely gained knowledge in a similar way.

Mentoring relationships are a successful way to achieve goals for both parties. Engagement builds one's reputation as a team player and develops skills around collaboration, accountability, deliverability, values and ethics, and interpersonal connections with co-workers. Mentoring provides access to the "movers and shakers" within an organization or professional field, which builds one's network. Through interactions, both mentor and mentee demonstrate to others who they are and what they stand for.

Being a mentor or a mentee is also part of lifelong learning, which is a value for every professional. Learning never stops, no matter how experienced someone is. There are always new applications, different ways of looking at things, and emerging technologies, as well as regulatory issues that develop and change.

To promote lifelong learning for professionals in the disability management field, the CDMS Commission has launched the CDMS Core Knowledge Curriculum. This online educational resource features modules that address each of the four domains of disability management. The CDMS Core Knowledge Curriculum can also be used to earn the Associate Disability Management Specialist [ADMS] designation, or for continuing education for certified professionals.

In addition, the CDMS sponsors a disability management professional

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Care Coordination for Children: Lessons for Success

By Sharon Silow-Carroll, MSW, MBA, and Gretchen Hagelow, MPA

Care coordination for children offers great benefit to both families and medical practices—particularly pediatricians, who serve the majority of families with children. Effective care coordination involves not only assisting families with navigating a complex set of medical and nonmedical support services, but also informing their primary care providers of the status of the referrals and interventions. This “feedback loop” enables practitioners to better track what needs have and have not been met to better serve their patients.

Why Target Young Children and Pediatric Practices?

Early childhood—the years between birth and age 3—is the time when children begin to develop the foundations of physical, behavioral, and social health that will shape their experiences in school and significantly impact their lives. Pediatricians and family practitioners play a vital role in promoting optimal childhood development, as they interact with young children and their families regularly during this period and can compare children’s progress with accepted milestones. Intervention is of greatest value when it begins early. Delaying services often results in a need for more treatment

This article is based on research resulting in an Issue Brief, and case studies supported by The Commonwealth Fund (www.cmwf.org).

and a greater intensity of services, over a longer period of time and with less effective results.¹

Early identification of potential developmental delays in young children is greatly improved when primary care providers perform structured developmental screenings. The American Academy of Pediatrics acknowledged this in 2006 when it issued the recommendation that children receive standardized screening for developmental delays at 9 months, 18 months, and 24 or 30 months of age.² However, early identification of potential delays is helpful only when it leads to effective intervention, which requires action from both medical practices and families. Physician offices must be able to refer patients to Early Intervention programs or link them to other appropriate supplemental services, and families must complete recommended referrals in a timely fashion. Both of these tasks can be challenging.

One major challenge is the difficulty facing many families of children and adolescents with an array of medical and nonmedical issues in navigating the health, mental health, education, social welfare, housing, and other support systems that might address their needs. These families are at risk for falling through the cracks, particularly without a qualified person to refer them to appropriate programs, help coordinate care, and provide support and follow-up to ensure needed services are received.

Coordinating care is time-consuming

for pediatric and family practitioners and often beyond their capacity, particularly for those in small practices. Making appropriate referrals requires an in-depth knowledge of the resources available in the community and state, and perseverance in contacting support services to find appropriate referrals. Furthermore, it can be difficult, if not impossible, for medical practices to secure adequate reimbursement for time-consuming care coordination and referral services.

Care Coordination Programs

We reviewed seven promising care coordination programs in five states that serve children and their families and offer a feedback loop to pediatric practices. Each model is unique, but below we identify and discuss a number of features that appear to contribute toward their success. The programs examined were:

- 1st Five Initiative, Iowa
- Pediatric Practice Enhancement Project (PPEP), Rhode Island
- Colorado Children’s Healthcare Access Program (CCHAP), Colorado
- Assuring Better Child Health and Development (ABCD), North Carolina
 - Partnership for Health Management
 - Carolina Collaborative Community Care (4C)
 - Sandhills Community Care Network
- Help Me Grow, Connecticut ▶

1ST FIVE INITIATIVE, Iowa

- Description**
- Administered by state public health department.
 - Provides mental and developmental health screening and referral forms, training to pediatric practices to conduct screenings and 1st Five referrals, community-based care coordinators that assess and make further referrals, and feedback loop to primary care physicians.
-
- Population Served**
- Pediatric practices and patients, children ages 0 to 5 and their families; focus on those with early signs of social, emotional, or mental health conditions.
 - All income levels and insurance types accepted; majority of referrals are Medicaid enrollees.
-
- Scope**
- 39 pediatric clinics serving more than 41,000 children and spanning 21 counties.
-
- Funding**
- State Healthy Mental Development Funds, tobacco taxes.
 - EPSDT/Medicaid and Title V covers care coordination for Medicaid and uninsured, respectively.
 - Additional funding sought to maintain and expand program.
-
- Results**
- 486 children referred in 2008, resulting in over 1,500 referrals to services.
 - 20 clinics and 14 hospitals in one county added social/emotional and family risk questions to EMR assessments.

EPSDT = Early Periodic Screening, Diagnosis, and Treatment.

PEDIATRIC PRACTICE ENHANCEMENT PROJECT (PPEP), Rhode Island

- Description**
- Administered by state department of health in partnership with Medicaid agency, nonprofit parent organization, and Medicaid health plan.
 - Places trained parents of CSHCN into pediatric practices to provide care coordination to patients and families.
-
- Population Served**
- Pediatric primary care providers, specialists, and staff, and their patients, CSHCN and their families.
 - All income levels accepted; majority of children served are Medicaid/CHIP enrollees.
-
- Scope**
- Nearly 3,000 CSHCN and their families (about 8% of CSHCN in the state) from 2004-2008.
 - As of mid-2009, parent consultants were in 24 sites statewide.
-
- Funding**
- New Freedom Initiative grant, Title V Maternal and Child Health Services federal block grant, and some funding from state department of human services.
 - Additional funding sources being sought to maintain and expand program.
-
- Results**
- Participants have more outpatient encounters but fewer inpatient admissions and less intensive resource use than nonparticipating CSHCN. Families report greater understanding and satisfaction regarding the health care service system, a sense of empowerment, and enhanced knowledge of available supports.

CSHCN = Children With Special Health Care Needs

EMR = electronic medical record.

COLORADO CHILDREN'S HEALTHCARE ACCESS PROGRAM (CCHAP), Colorado

Description	<ul style="list-style-type: none"> Nonprofit organization assists providers and families with care coordination and other support services for Medicaid-eligible children, with feedback to pediatrician, trains clinical practice staff in care coordination functions. Participating practices receive higher medical home reimbursement rate from Medicaid.
Population Served	<ul style="list-style-type: none"> Private pediatric and family practices and their Medicaid-eligible pediatric patients and families.
Scope	<ul style="list-style-type: none"> 140 pediatric practices (93% of the state's private pediatric practices); 450 providers serving 1.2 million children statewide, plus 40 family practices as of October 2009. Primarily active in the Denver metro area, but expanding into rural areas.
Funding	<ul style="list-style-type: none"> Multiple foundations; in-kind donations from the University of Colorado Denver School of Medicine and The Children's Hospital. Enhanced reimbursement to CCHAP practices through the existing state Medicaid EPSDT program.
Results	<ul style="list-style-type: none"> High physician and family satisfaction with CCHAP participation; large increase in Medicaid/CHIP children served by private practices. Children in participating practices visit the emergency department less often, have more preventive care visits, and are less expensive for the state Medicaid program than children in nonparticipating practices.*

CHIP = Children's Health Insurance Program
 CSHCN = Children With Special Health Care Needs.

* The evaluation was not able to determine the extent that CCHAP participation contributed to these outcomes.

ASSURING BETTER CHILD HEALTH AND DEVELOPMENT (ABCD), North Carolina: PHM, 4C, Sandhills

Description	<ul style="list-style-type: none"> Community Care of North Carolina (CCNC), a network of 14 community care networks (CCNs) serving Medicaid enrollees throughout the state supported physician practices with training and tools to increase screening, appropriate referral, and follow-up. Approaches vary based on local needs.
Population Served	<ul style="list-style-type: none"> Pediatricians and other providers, and their patients, Medicaid-eligible children from birth to age 5 with developmental disabilities and delays, and their families.
Scope	<ul style="list-style-type: none"> 14 local CCNs serving low-income individuals enrolled in Medicaid and CHIP across the state. Three local CCN sites studied include a total of almost 200 medical practices serving 40,000 Medicaid and CHIP enrollees from birth to age 5 in 11 counties.
Funding	<ul style="list-style-type: none"> Three-year Commonwealth Fund grant supported initial ABCD program. CCNs receive \$3 per member per month from the state to provide case management services for a variety of services, including care coordination. Others partner with nonprofits to cover ongoing activities.
Results	<ul style="list-style-type: none"> Across the state, children from birth to age 3 receiving early-intervention services increased from 3% in 2003 to 4.3% in 2008. Number of developmental screenings completed at Medicaid EPSDT visits quintupled from 2004 to 2008.

EPSDT = Early Periodic Screening, Diagnosis, and Treatment.

HELP ME GROW (HMG), Connecticut

Description	<ul style="list-style-type: none"> Administered by the Connecticut Children’s Trust Fund program that provides families referrals and care coordination through a toll-free phone line, with feedback loop to providers. Provides follow-up for families screened for birth-to-age-3 services, on-site training for providers and parents in screening and early detection of developmental and behavioral concerns. Liaisons with community services and agencies. The 2008 pilot connected hard-to-reach families referred by other agencies with services.
Population Served	<ul style="list-style-type: none"> Serves pediatricians and other providers and their patients, children up to age 8 who are at risk for developmental or behavioral problems and their families. All income levels and insurance accepted.
Scope	<ul style="list-style-type: none"> Available statewide. In 2008-2009, HMG care coordinators made over 4,000 referrals on behalf of children and families.
Funding	<ul style="list-style-type: none"> State-funded Children’s Trust Fund and early support from The Commonwealth Fund. Contracts with United Way.
Results	<ul style="list-style-type: none"> 88% of service needs were addressed in 2008-2009, an increase from 80% reported in the previous year.

Maximizing Efficiencies Through Shared Resources

One key feature of the programs examined is the use of a shared community resource or care coordination and referral “utility.” This refers to one community-based or statewide entity providing centralized services, such as assistance with referrals, for multiple medical practices and families in a community. Colorado’s CCHAP and Connecticut’s Help Me Grow, for example, provide centralized telephone help lines that family members, physicians, and practice staff can call to learn about community resources and to get referrals to other programs and services. The help lines also provide care coordination when needed. Similarly, Rhode Island’s PPEP model involves one outside organization, the Rhode Island Parent Information Network, which hires, trains, and manages coordinators who are placed in numerous medical practices.

The model of shared resources brings obvious efficiencies: it eliminates the need for each medical practice to hire, train, supervise, and compensate

care coordinators. The task of developing and maintaining a resource database alone is a tremendous undertaking and is one that can be most efficiently conducted on a community-wide basis rather than duplicated in each medical practice. The shared resource model also allows each entity—such as a medical practice, family-to-family organization, or group of specially trained public health nurses, for example—to focus primarily on what it does best (eg, primary care, peer support, and care coordination).

Engaging Pediatric Practices

Ongoing, in-depth involvement with individual medical practices and their staff is essential. Care coordination program planners and administrators stress that getting practices on board requires engaging not only pediatricians, but often more importantly, office managers and nurses who put new policies (eg, referral forms) into practice.

It is important to identify individuals who are the decision makers at an office or clinic and who can implement change as “champions” for a new

program. This is generally accomplished through early meetings with practice staff. It may be a pediatrician who can bring other physicians on board with a new screening and referral protocol. More often, it is an office manager or nurse who integrates a new process into the daily routine. A relationship with this change agent can be developed, nurtured, and maintained through face-to-face meetings, supportive phone calls, and technical assistance.

Finally, education, training, and support are not one-time, but rather, ongoing activities. Program staff must return to the medical practices, check in with nurses and office managers, monitor which physicians and practices are not fully participating, and address problems. Ist Five project coordinators, for example, contact participating practices on a regular basis, attend nurses’ meetings, and frequently talk with front-line office staff. CCHAP conducts practice manager meetings every other month to update office staff on programmatic changes, community resources, and budget issues affecting support services.

Experience suggests that the qualifications, background, and training of care coordination and other personnel should be based on the target population and goals of the program. All programs struggle with cost pressures and are looking to find the right balance of lower-cost and higher-cost personnel.

Providing Training and Tools

There is no one-size-fits-all approach to hiring and training care coordinators. Experience suggests that the qualifications, background, and training of care coordination and other personnel should be based on the target population and goals of the program. All programs struggle with cost pressures and are looking to find the right balance of lower-cost and higher-cost personnel. PPEP's approach involves hiring "peer-to-peer" parent consultants—that is, family members of children with special needs who act as counselors and advisors to other families. These parent consultants are relatively low cost but can directly address family concerns with true empathy as well as skills for negotiating complex medical and nonmedical systems. Supplemental training in a range of required skills, along with supervision and a monthly professional development day, help ensure that parent consultants are equipped to do their jobs.

In other cases, nurses with clinical experience may be more appropriate for care coordination initiatives. Care coordinators who take calls and inquiries from physicians and medical practice nurses in addition to those from families benefit from being able to talk the same language as their clinical counterparts. Alternatively, social workers may be most appropriate to coordinate services for families with multiple social and economic needs. Regardless of their credentials and backgrounds, care coordinators must have good training and tools to document and track client information and to identify resources for the child and family.

Similarly, resource coordinators must have the tools to track and update lists of community resources and state programs, eligibility criteria, and capacity. Such tasks are infinitely easier and the subsequent product more useful when systems are computerized, so states may need to make investments in equipment and training to increase effectiveness of care coordination.

Given the emotional nature of serving families with multiple and complex needs, regular communication among care coordinators and other project staff are common. Such interactions allow care coordinators to share experiences and give each other emotional support, practical information about services and programs, and ways to better serve both families and practitioners.

Leveraging Existing Systems and Creating Partnerships

Whether public or private, the care coordination programs examined in this article build on some type of existing infrastructure at the state level and involve partnerships with state and community agencies. Iowa's 1st Five initiative, for instance, uses the public health system to build programs at the community level—using visiting nurse agencies and county health departments to provide care coordination services. Help Me Grow has its own toll-free number but shares information with the state's 211 telephone line, which provides free information and referral for community-based social and health services.

Because children enrolled in Medicaid often have complex needs

involving social and medical factors, having a formal or informal partnership between a care coordination program and Medicaid is particularly important. CCHAP is addressing systemic barriers to the provision of medical home services, including care coordination, to Medicaid patients, partnering with the state's Medicaid agency to ensure higher payments for some Medicaid services. Enhanced reimbursement is provided through federally approved Early Periodic Screening, Diagnosis, and Treatment (EPSDT) incentive payments as long as practices meet the state's medical home mandate.

In addition to Medicaid, care coordination programs partner with state agencies and programs in which responsibility or funding may overlap and to whom patients are often referred, such as Early Intervention and Title V. For example, to provide care coordination through 1st Five, Iowa's department of public health contracts with visiting nurse agencies and county health departments that are already designated as Title V Maternal and Child Health organizations. The program uses care coordinators at these agencies who generally work with children covered under Medicaid or the Children's Health Insurance Program (CHIP) to arrange EPSDT and other services.* Becoming a 1st Five Child Health Center allows care coordinators to integrate principles of children's healthy mental development into their work,† and expands services to all children referred by participating practices, including those with commercial insurance. Costs are covered by a combination of Medicaid ►

Evaluation of the care coordination program itself is essential to alter processes that are not working properly and assess and document the program's value. Evidence of positive value can justify to funders or state officials the program's continuation, expansion, or replication.

reimbursements, Title V funds, and the 1st Five program itself.

In addition to partnering with public agencies, some care coordination programs found private partners to supply or augment resources. Help Me Grow, for instance, collaborates with the United Way, and CCHAP receives funding and in-kind support from philanthropic organizations. Advocacy groups can also play an important role in developing, implementing, sustaining, and publicly promoting programs. This is true in Rhode Island, where private nonprofit Family Voices is responsible for hiring, training, and supervising PPEP's parent consultants.

Collaboration at the state and local levels, by engaging stakeholder groups from the outset and continuing to solicit their input and support throughout the implementation process is critical to success. Locally, programs must engage both medical practices and community agencies to ensure

*Through a partnership between the Iowa Department of Public Health and Medicaid, about 22 agencies serving Iowa's 99 counties are selected as Title V child health screening centers through a competitive bid process every five years. With state, local, and federal funding from a Maternal and Child Health Block Grant, as well as Medicaid reimbursement for covered services, these agencies coordinate screening and referrals for Early Periodic Screening, Diagnosis, and Treatment (EPSDT) services (including periodic screening, vision, dental, and hearing services) and conduct public health training, nutrition, and other preventative health services and referrals.

‡While such screening and referral has long been an EPSDT requirement, this requirement is often not closely adhered to.

open communication and to reduce duplication of efforts. In fact, care coordination often already exists for certain populations, but families and providers do not know what is available and how to access it. At the state level, collaboration among stakeholders increases efficiency by reducing duplication of efforts and breaks down barriers that tend to exist across disciplines. It also creates a unified message to policymakers about the goals and value of a program, which can lead to sustained financial and policy support.

Making Funding and Sustainability a Priority

Even if programs leverage and partner with existing programs and systems, they must have an initial capital investment for pilot projects and keep an eye toward securing sustainable funding. The programs in this report use different strategies, but most find that funding and sustaining care coordination programs are ongoing challenges, especially given economic conditions that have fueled state cutbacks in pilot programs and Medicaid. In this environment, a combination of private and public (federal and state) funding is beneficial, at least until services and programs are embedded in comprehensive, integrated, statewide systems of care.

Incorporating Flexible Program Design

Flexibility of program design at the community or practice level is critical to implementing and sustaining initiatives across locations. Communities implementing a care coordination

model vary widely in terms of service gaps, demographics, geography, and medical practice capacity. Further, individual practices within a community range in terms of size, patient mix, and level of information technology. Successful programs allow each community or practice the ability to adapt a model to best meet the needs of its providers and patients.

For instance, CCNC relies on local networks to determine the types of community partnerships and staffing models that will best serve individual communities. Each network delivers screening, referral, and care coordination services that are most appropriate to its population, geography, and provider capacity. 1st Five takes a similar approach, bringing together coalitions of public and private community stakeholders to determine how best to adapt the general state model to their particular circumstances.

Similarly, flexibility at the practice level is necessary to accommodate implementation by a diverse range of practice types. Each participating PPEP practice decides how best to use 25% of parent consultants' time; in doing so, practices are able to tailor the program to their specific needs. Some have parent consultants follow up on referrals, while others assist with patients' Medicaid enrollment.

Assessing Service Gaps and Evaluating Effectiveness

Care coordination programs can and must identify service gaps that might otherwise go undetected. For instance, the 1st Five program found that

The nature of child development demands a focus on the entire family, including the relationships and well-being of caregivers and siblings.

treatment for parental depression was universally lacking. PPEP discovered a number of common barriers to service delivery, including availability and accessibility of child care, dental care, therapeutic recreation, translation, and other services. Programs in Colorado, North Carolina, and Iowa found that rural or remote communities face different challenges and often much more severe service gaps, requiring creative solutions. Most have a systematic way of identifying and tracking these gaps and can then inform advocates, policymakers, funders, and relevant stakeholders to begin addressing them.

In addition, evaluation of the care coordination program itself is essential to alter processes that are not working properly and assess and document the program's value. Evidence of positive value can justify to funders or state officials the program's continuation, expansion, or replication. Objective evaluation should assess to what extent a care coordination program affects patient and provider satisfaction, appropriate and completed referrals, utilization of different types of services, total cost of care, and the child and family's functioning.

All of the programs examined track and assess some of these indicators, but measuring impact can be complex. The programs reported an increase in the number of children and families identified with unmet needs and referred to appropriate services, as well as higher patient and provider satisfaction. Even more promising preliminary findings from some programs indicate substantial cost savings from reduced use of expensive services like inpatient care. Evidence of CCHAP's early success helped spark a similar pilot initiative in another state.

Taking a Holistic Approach to Care Coordination

The programs studied acknowledge that child development goes beyond the traditional medical model. Child development affects and is affected by education, nutrition, and housing, among other factors. Further, referrals to a care coordinator for one problem frequently result in multiple additional referrals, as care coordinators discover additional unmet needs, especially among vulnerable populations.

There is a need, therefore, to educate families about the interconnected nature of developmental issues and the importance of adhering to suggested referrals and care plans. In some programs, multiple no-shows for appointments trigger a phone call to discover the underlying problems—transportation, child care, or even a simple need for reminders—and how to address them.

Three of the programs examined are integrating care coordination into medical home initiatives. CCHAP provides 14 support services to pediatric practices, which qualify for medical home enhanced payments from Medicaid. Support services include assisting in Medicaid enrollment and claims submissions, helping families obtain transportation, training in cross-cultural communication, obtaining child development screening tools, and assisting with quality improvement projects. In North Carolina, CCNC physicians are paid a \$2.50 per member per month supplement to provide a medical home and play a more active role in the health needs of their patient population. The 14 networks in CCNC also receive funding to provide case management

services to the same population.

Further, the nature of child development demands a focus on the entire family, including the relationships and well-being of caregivers and siblings. Ist Five screening includes an assessment of caregiver depression, as caregiver stress puts children at risk of neglect and abuse. CCHAP care coordinators contact a family within 24 hours of a referral from a pediatric office, not only to discuss the referral itself but to also more generally assess how the family is functioning and if additional support services would help. PPEP's parent consultants provide practical guidance as well as empathy to caregivers. The parent-to-parent model addresses the frustration of navigating medical and non-medical systems to access services for children with special needs. **CEU**

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Sharon Silow-Carroll, MSW, MBA, is a health policy analyst and a principal at Health Management Associates in their New York office. Gretchen Hagelow, MPA, is a vice president at Ranieri Partners.

Using Predictive Analytics Tools to Create Successful Disease Management Programs

By Russ Allen, MS, and Jennifer Maybin, MA, ELS

With more than 220,000 patients in more than 40 counties in its plan, Geisinger Health Plan (GHP) has a formidable population management responsibility. In the mid-1990s, GHP increased its focus on managing populations with targeted disease-management conditions. Nearly 10 years later, though, most of its limited methodologies remained internally developed and it had not sought outside tools or consultation. As a result, its process of referral for disease management remained heavily and overly dependent on physician referral. “We also used pieces of our claims system for a kind of poor man’s disease management system,” recalls Vice President of Health Services Janet Tomcavage, RN, MSN. “We saw good impact on many individual outcomes, such as improvements in A1C and blood pressure, but had difficulty consistently demonstrating a positive ROI [return on investment] for this activity.”

Even though GHP had begun to manage diseases, patients, and care through the efforts and energies of its nurse case managers, it was not using

a selection process that gave it the efficiency to manage costs across populations. The health plan knew the value that case managers in this role could bring to primary care, but questioned whether it had an adequate process to identify the right patients—and enough of them—with whom the case managers could intervene. “With so many patients to manage, the question was, where do you find the most value from this level of resource—nurse case managers—so that they have the maximum impact? Our experience with an in-house approach brought to light that we did not have a good tool for identifying the right population of patients and for risk-stratifying them.”

“We felt we were not necessarily identifying the patients at risk or with the most complex needs,” says Tomcavage. “We came to realize that our approach lacked the intelligence that comes from data systems based on larger experiences.”

Geisinger charged Tomcavage with re-engineering its process for case management. After consulting with other health plans and knowledgeable sources in the disease-management industry, her group chose a tool called Risk Navigator Clinical, developed by Elsevier’s MEDai division, to globally risk-stratify its community-based populations. The health plan set up the process for inputting its data and brought this solution and interface fully online at the start of 2007.

What Is Predictive Modeling?

Risk Navigator Clinical is a predictive modeling tool that enables users to stratify patients based on their risks for certain diseases. Whereas chart reviews and prescription fill rates have been used in the past to tease out those patients who may be at risk for catastrophic and expensive health events, the sheer volume of data was overwhelming to comb through without computerized and integrated systems of analysis. Predictive modeling is a mathematical tool that can be as simple as linear equations or a more sophisticated program that can determine nonlinear relationships among data. This type of modeling has been used by financial services and in meteorology and air traffic control.¹

Disease management programs have historically focused on patients with chronic health problems such as heart failure, diabetes, asthma, and diabetes to help control utilization and improve outcomes for patients through enhanced preventive care. Predictive modeling, on the other hand, takes a broader approach and identifies patients who are at risk for chronic disease and may be at risk in the future. One disease management company says it has used predictive modeling to identify 30 “impact conditions” that can cause chronic health problems but can also be prevented or reduced by interventions.¹

The idea behind predictive

Russ Allen, MS, is a writer at The Writers Studio (www.writersstudio.com) in Philadelphia who interviewed Janet Tomcavage and is responsible for parts of this article.

Jennifer Maybin, MA, ELS, is the Executive Editor of CareManagement.

VALUE-BASED BENEFIT DESIGN (VBBD)

Predictive modeling has also been used by health plans to design benefit plans that seek to mitigate adverse health consequences by lowering or eliminating out-of-pocket costs for high-value medical services according to patient need.^{1,2} Traditional benefit plans are modeled on cost sharing based on the premise that increasing the cost for a health care service will reduce use of that service—unless that service is of high value. A value-based benefit design (VBBD) promotes the use of low or no co-pays for medically necessary, evidence-based, cost-effective services by specific patient populations who will gain the most benefit.³ VBBD is based on two principles⁴: (1) medical services have differing clinical benefits and (2) the value of specific interventions varies among patient groups.

By using predictive modeling, health plans can determine the incremental benefits of treatment for certain patient populations relative to the incremental costs of that treatment.^{2,5} The plans then can establish lower co-pays for patients who meet the clinical criteria for cost-effective use of the service. The goal is to improve patient adherence to high-value services⁶ that will help to prevent worsening of the condition, which, in the long run, will keep health care costs down.

For example, beta-blockers are used to treat a variety of conditions, including tremor (low risk), hypertension (moderate risk), and chronic angina (higher risk), as well as to prevent heart failure in patients who have had a myocardial infarction (very high risk). Predictive modeling shows that the greatest benefit of beta-blocker use is in preventing heart failure and the lowest benefit is in treatment of tremor. This is because future health care costs are not expected to significantly multiply for patients with tremor, whereas patients who progress to heart failure are expected to increasingly consume health care resources. Therefore, a VBBD would assign a low co-pay for beta-blocker prescriptions among patients at risk for or with heart failure, but would keep the co-pays for beta-blockers at a higher level for patients with tremor.^{1,2,7}

ROI expectations are based on presumed reduction in hospitalizations, emergency department visits, or other future health care expenditures because of complications or worsening disease. ROI is also expected in nonmedical costs such as reduced absenteeism and disability and increased productivity.⁴ Calculation of this ROI requires predictive modeling.

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modeling is to identify patients who are at the greatest risk of having a future adverse health event that will use significant health care dollars and resources (see “Value-Based Benefit Design”). Identifying at-risk patients within a certain population allows tailoring of a disease management program that will help to head off these events by educating patients on self-care such as smoking cessation, weight loss, improved glucose control, and so on. Preventive health spending, including greater case management spending, may be increased for the subset of patients who are at risk for a particular disease.

Predictive modeling often uses data collected by health plans, which are at the center of information flow. Reimbursement claims show patterns of physician, hospital, laboratory, and pharmaceutical care. When these data are collected, cleaned up, integrated, analyzed, and interpreted, a powerful profile of patients emerges along with a view of existing patterns of care.² Predictive modeling can answer questions such as:

- Is current care provided according to clinical guidelines?
- Are there patterns of overuse or underuse of clinical measures?
- Are physicians and other health care practitioners providing quality and efficient care?
- Are patients following recommended self-care programs and filling prescriptions?

Often, use of information that comes out of predictive modeling is focused on developing patient-oriented programs—that is, changing patient rather than physician behavior. Patient-oriented programs are many times managed by nurses and case managers who provide education and other preventive services to at-risk groups of patients.² Increasingly more sophisticated predictive modeling tools like Risk Navigator Clinical also incorporate risk drivers for certain disease

states. For example, among patients with diabetes, predictive modeling can determine if most of the future risk is driven by the diabetic condition itself or by associated comorbidities such as coronary artery disease, vision problems, or renal failure. These new tools may also interpret both the chronic and acute impact of a disease—the

use of both inpatient and outpatient services. Another factor incorporated in some predictive modeling tools is motivation—how well do patients adhere with instructions from their care providers and follow through with self-care?

Predictive modeling can also support success in the patient-centered

medical home (PCMH) where patient outcomes are meant to improve through care planning, use of evidence-based medicine and clinical decision support tools, accountability among health care providers for quality improvement through performance measurement, and patient participation in decision-making.³

FIGURE 1. Sample Patient Panel

POPULATION IDENTIFICATION 7/1/2007 TO 6/30/2008 AIS 80-100 AND/OR RISK RANK 5									
Forecasted Risk Index	AIS	CIS	Risk Rank	Sex	Age	Total Paid	Forecasted Cost	Primary ETG Group	Program Status as of 8/27/08
4.1	91	35	5	M	82	\$42,187	\$44,456	CVA	MHOpenr
4	80	37	5	M	68	\$46,972	\$43,405	CV Surgery	Closed—need met
6.21	100	28	5	M	67	\$137,724	\$67,387	Infectious Disease	MHIdentified
3.19	93	25	5	F	75	70,344	\$34,563	Degenerative Ortho Disease	MHCL—needs met
4.53	94	60	5	M	81	\$49,157	\$49,173	CVA	
10.2	97	51	5	F	71	\$133,870	\$110,630	Renal Failure, Chronic & Nephrosis	MHOpen
5.59	90	62	5	M	81	\$25,981	\$60,613	Renal Failure, Chronic & Nephrosis	MHIdentified
8.87	95	50	5	F	79	\$113,895	\$96,235	Renal Failure, Chronic & Nephrosis	MHCL-CC

To bring better population management to its Medical Home primary care practices, GHP needed a health plan metrics tool that helped it identify individuals who would benefit most from case management. Sheets such as this one, produced by MEDai's Risk Navigator Clinical, help the plan's embedded nurse case managers interact with providers and patients at clinic sites throughout the system.

How Predictive Modeling Is Used at GHP

Tomcavage's clinical reporting team now generates monthly patient lists for its case managers, who use them to concentrate attention on patients who have risk scores of 4 or 5 (on a scale of 1 to 5, and with an acuity index score of 80 to 100) (see Figure 1). They also use the "movers" feature of Risk Navigator Clinical, which flags patients who move up 2 or more risk levels in the course of a month. This concentration on "movers" allows the health plan to lower costs by intervening earlier.

In this way, the case manager has straightforward criteria for enrolling patients in case management. By discussing these cases with the practice physician while referring to the electronic medical record, the nurses can add to their notes and can plan and support interventions and counseling. Additionally, the tool's "motivation" score is being used to predict which patients will prove the best participants in taking charge of their health.

"Using Risk Navigator Clinical to drive risk stratification is so much easier than going through our records manually," says Tomcavage, "and it gives us a more comprehensive snapshot than we had before."

The scores also serve as targets for improvement. They permit the team to stratify groups of employees into low-, moderate- or high-risk subsets.

Information Management for Medical Home Program

GHP employs more than 50 nurses in this case management role. They work in 37 GHP-owned clinics and seven other participating, contracted clinics. Most of them are assigned full-time to a single large site. "These nurses see themselves as part of the clinic and an extension of the practice," explains Tomcavage.

As such, the case managers also serve as a key component of—and, in

fact, the basis for—Geisinger's pioneering "Medical Home" program. This partnership between plan and primary care sites focuses on enhanced access to care and targeted action for high-risk individuals. Looked upon as the next generation of medical management, it works to keep patients in the "sphere of influence" of primary care around the clock, every day. It also includes aspects of pay-for-performance and health care consumerism. Information management, using the Risk Management tool, drives cooperation between the plan, provider, and case manager.

The nurses can log onto the application at the point of care to help guide the intervention, often after having done so initially with the physician to review the cases proposed for management. Tomcavage's team has found that the doctors usually agree quite readily to the additional case-management component of care. "We weren't sure how the providers would react to it at first, but they view these informatics, and the nurse interventions that follow them, as great tools," she says, noting also that assessing and intervening with risk in this way is especially useful in Medicare populations, which may not receive the coordinated care that they need. "We are often bringing patient-management data that the providers have never seen and don't know about, with regard to their practice," she adds. "They are shocked sometimes by the cost of care for specific patients. Plus, we can help them spot patients that they've lost track of, often because the patient comes in only episodically. Reviewing panels of patients like this can be a great avenue into case management at these practice sites."

Results Bear Out Value

GHP is using the metrics from Risk Navigator Clinical in its Medical Home program for some sites that have thousands of patients. Across locations, it

has seen a decrease in admissions, including challenging patient populations such as those with heart failure and chronic obstructive pulmonary disease (COPD). The plan is also pleased and optimistic about the trending it sees with its diabetes patients.

"In hindsight, this experience has also confirmed to us that using expensive case management resources with lower-risk patients is not cost effective," notes Tomcavage, who has presented nationally on the Medical Home program.

That said, though, her group is looking for ways to use the measures to direct program resources efficiently to patients of more moderate risk as well. Medical Home has concentrated on approximately the 15% of patients at highest risk. But the team would like to proactively affect the top half of the risk pool and, additionally, the well segment of the population, using steps that have a positive ROI.

Tomcavage states, "If you want to transform care and drive efficiency, experience, and quality, neither the insurer nor the clinician can do it alone. The health plan and provider have to do it together, using predictive modeling with sophisticated risk data as the secret sauce." **CEU**

Exam starts on page 18

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Exam 1

Care Coordination for Children: Lessons for Success

1. **Effective care coordination involves informing the primary care providers of the status of referrals and interventions.**
a. True b. False
2. **Starting early rather than later with interventions for children with special needs has no effect on outcomes.**
a. True b. False
3. **The American Academy of Pediatrics recommends standardized screening for developmental delays at the following ages:**
a. 9 months
b. 18 months
c. 24 months
d. 30 months
e. All of the above
4. **Early identification of developmental delays is helpful only when it leads to effective intervention.**
a. True b. False
5. **A key for success is having both the family and physician practice working together.**
a. True b. False
6. **One key factor in success in care coordination for children is to have one community-based or statewide entity providing centralized services such as assistance with referrals for multiple medical practices and families in a community.**
a. True b. False
7. **A shared resource model benefits the following:**
a. The medical practice
b. Family-to-family organization
c. Group of specially trained public health nurses
d. Case managers
e. All of the above
8. **Education, training, and support are ongoing activities.**
a. True b. False
9. **Funding and sustaining care coordination programs presents ongoing challenges, especially given current economic conditions, but a combination of private and public funding is beneficial.**
a. True b. False
10. **Evaluation of care coordination programs is essential to alter processes that are not working properly and assess and document the program's value.**
a. True b. False

Exam 2

Using Predictive Analytics Tools to Create Successful Disease Management Programs

1. **Disease management programs have historically focused on patients with chronic health problems such as heart failure, diabetes, and asthma to help control utilization and improve outcomes through enhanced preventive care.**
a. True b. False
2. **Predictive modeling is a tool used to identify patients who are at the greatest risk of having a future adverse health event that would use significant health care dollars and resources.**
a. True b. False
3. **Predictive modeling is a mathematical tool that can be as simple as linear equations or a more sophisticated program that can determine nonlinear relationships among data.**
a. True b. False
4. **Predictive modeling can answer questions such as:**
a. Is current care provided according to clinical guidelines?
b. Are there patterns of overuse or underuse of clinical measures?
c. Are the providers providing quality and efficient care?
d. Are patients following recommended self-care programs and filling prescriptions?
e. All of the above
5. **Often use of information that comes out of predictive modeling is focused on developing programs that change the physician's behavior.**
a. True b. False
6. **The recent generations of predictive modeling incorporate risk drivers for certain disease states.**
a. True b. False
7. **Another factor in some predictive modeling tools is motivation—how well do patients adhere with instructions from their care providers and follow through with self-care.**
a. True b. False
8. **In predictive modeling, using data from claims, reimbursement, and patient history along with providers' EMR reports can generate risk scores and an acuity index for each patient at risk.**
a. True b. False
9. **Using a software program for data analysis is better than manually accumulating the data.**
a. True b. False
10. **To transform care and drive efficiency and quality, predictive modeling is a useful tool for health plans and providers who work together.**
a. True b. False

These educational manuscripts have been approved for 2 hours of CCM and CDMS education credit each by The Commission for Case Manager Certification and the Certification of Disability Management Specialists Commission. Provider #00059431. The answer sheet for these tests must be received by November 30, 2011. Expired exams cannot be returned. Faxed exams cannot be accepted. You may submit one or both exams; credits will be granted accordingly.

Exam 1: Care Coordination for Children: Lessons for Success

Please indicate your answer by filling in the letter:

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____

Exam 2: Using Predictive Analytics Tools to Create Successful Disease Management Programs

Please indicate your answer by filling in the letter:

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____

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Exam 1:

1	2	3	4	5
1	2	3	4	5
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Exam 2:

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1	2	3	4	5
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PharmaFacts for Case Managers



Tradjenta (linagliptin)

The US Food and Drug Administration (FDA) has approved linagliptin tablets, a prescription medication used along with diet and exercise to lower blood sugar in adults with type 2 diabetes. The FDA has approved linagliptin as a monotherapy or in combination with other commonly prescribed medications for type 2 diabetes—such as metformin, sulphonylurea and pioglitazone—to reduce hemoglobin A1c (HbA1c or A1c) levels by a mean of up to -0.7% (compared to placebo). HbA1c is measured in people with diabetes to provide an index of blood sugar control for the previous two to three months. It is used as a marker of efficacy of antihyperglycaemic therapies.

Linagliptin belongs to a class of prescription medications called dipeptidyl peptidase-4 (DPP-4) inhibitors and is the first member of its class to be approved at one dosage strength (5 mg, once daily). With linagliptin, no dose adjustment is recommended for patients with kidney or liver impairment. Linagliptin is a tablet that can be taken with or without food. Linagliptin lowers blood sugar in a glucose-dependent manner by increasing incretin levels (GLP-1), which increase insulin levels after meals and throughout the day.

“Many people with type 2 diabetes are not able to control their blood sugar with diet and exercise alone and may also require one or more medications,” said John Gerich M.D., Professor of Medicine, University of Rochester School of Medicine. “The FDA approval of linagliptin is exciting because there is only one dose to remember for all patients, regardless of kidney or liver impairment. With linagliptin, physicians will have another option for managing type 2 diabetes, a potentially devastating condition.”

Linagliptin 5 mg once daily was approved based on a clinical trial program that included approximately 4,000 adults with type 2 diabetes. Included in the program were 3 placebo-controlled studies evaluating linagliptin as monotherapy and in combination with the commonly prescribed oral antihyperglycaemic medications metformin and sulphonylurea. Linagliptin showed

statistically significant mean difference in HbA1c from placebo of up to -0.7% when used as monotherapy. In patients who were not adequately controlled on metformin or metformin plus sulphonylurea, the addition of linagliptin resulted in a statistically significant mean difference in HbA1c from placebo of -0.65.

In a fourth study, the initial combination of linagliptin and pioglitazone was compared with pioglitazone alone. The difference in the adjusted mean HbA1c between the linagliptin and placebo groups was -0.5% ($P < 0.0001$). For patients taking linagliptin plus pioglitazone, mean HbA1c change from baseline was -1.1% compared to a change of -0.6% for patients taking pioglitazone alone ($P < 0.0001$).

Treatment with linagliptin also produced significant reductions in fasting plasma glucose (FPG) compared to placebo, when used as monotherapy and in combination with metformin, sulphonylurea and/or pioglitazone. Treatment with linagliptin produced significant reductions in two-hour post-prandial glucose (PPG) levels compared with placebo as monotherapy and when used in combination with metformin. FPG is used to determine glucose levels in a fasting state (usually upon waking in the morning), and PPG is used to determine glucose levels after meals (usually 2 hours after eating).

In controlled studies, change from baseline in body weight did not differ significantly between groups when linagliptin was administered as monotherapy, in combination with metformin, or in combination with metformin plus sulphonylurea. Patients treated with linagliptin exhibited a significant mean decrease from baseline body weight compared to a significant weight gain in patients administered sulphonylurea (-1.1 kg vs +1.4 kg, $P < 0.0001$). Patient weight increased in both the linagliptin plus pioglitazone and placebo plus pioglitazone groups during the study with an adjusted mean change from baseline of 2.3 kg and 1.2 kg, respectively ($P = 0.0141$).

Adverse reactions reported in greater than or equal to 5% of patients treated with linagliptin and more commonly than in patients treated with placebo included nasopharyngitis.



Hypoglycaemia was more commonly reported in patients treated with the combination of linagliptin and sulfonylurea compared with those treated with the combination of placebo and sulfonylurea. The incidence of hypoglycaemia was similar to placebo when linagliptin was administered as monotherapy or in combination with metformin or pioglitazone. Pancreatitis was reported more often in patients randomized to linagliptin (1 per 538 person years vs 0 in 433 person-years for comparator).

Linagliptin should not be used in patients with type 1 diabetes or for the treatment of diabetic ketoacidosis (increased ketones in the blood or urine). It has not been studied in combination with insulin.

Zytiga (abiraterone acetate)

The FDA has approved Zytiga (abiraterone acetate) in combination with prednisone for the treatment of patients with metastatic castration-resistant prostate cancer (CRPC) who have received prior chemotherapy containing docetaxel.

Zytiga is a pill that targets a protein called cytochrome P450 17A1 (CYP17A1), which plays an important role in the production of testosterone. The drug works by decreasing the production of this hormone that would stimulate cancer cells to continue growing.

The efficacy and safety of Zytiga in patients with metastatic castration-resistant prostate cancer (CRPC) who had received prior chemotherapy containing docetaxel were assessed in a randomized, placebo-controlled, multicenter phase 3 clinical trial. A total

of 1,195 patients were randomized 2:1 to receive either Zytiga orally at a dose of 1,000 mg once daily in combination with prednisone 5 mg orally twice daily (n=797) or placebo once daily plus prednisone 5 mg orally twice daily (n=398). Patients randomized to either arm were to continue treatment until disease progression (defined as a 25%

increase in prostate-specific antigen (PSA) over the patient's baseline/nadir together with protocol-defined radiographic progression and symptomatic or clinical progression), initiation of new treatment, unacceptable toxicity or withdrawal. Patients with prior ketoconazole treatment for prostate cancer and a history of adrenal gland or pituitary disorders were excluded from this trial.

The following patient demographics and baseline disease characteristics were balanced between the treatment arms. The median age was 69 years (range 39-95) and the racial distribution

was 93.3% Caucasian, 3.6% Black, 1.7% Asian, and 1.6% other. Eighty-nine percent of patients enrolled had an ECOG performance status score of 0-1 and 45% had a Brief Pain Inventory score of ≥ 4 (patient's reported worst pain over the previous 24 hours). Ninety percent of patients had metastases in bone and 30% had visceral involvement. Seventy percent of patients had radiographic evidence of disease progression and 30% had PSA-only progression. Seventy percent of patients had previously received 1 cytotoxic chemotherapy regimen and 30% received 2 regimens.

The protocol prespecified interim analysis was conducted after 552 deaths and showed a statistically significant improvement in overall survival in patients treated with Zytiga compared with patients in the placebo arm. An updated survival analysis was conducted when 775 deaths (97% of the planned number of deaths for final analysis) were observed. Results from this analysis were consistent with those from the interim analysis (Table 1).

Contraindications

Zytiga may cause fetal harm (Pregnancy Category X) when administered to a pregnant woman. Zytiga is contraindicated in women who are or may become pregnant.

Warnings and Precautions

Use Zytiga with caution in patients with a history of cardiovascular disease. Zytiga may cause hypertension, hypokalemia, and fluid retention as a consequence of increased mineralocorticoid

levels resulting from CYP17 inhibition. Coadministration of a corticosteroid suppresses adrenocorticotrophic hormone (ACTH) drive, resulting in a reduction in the incidence and severity of these adverse reactions. Use caution when treating patients whose underlying medical conditions might be compromised by increases

in blood pressure, hypokalemia, or fluid retention, eg, those with heart failure, recent myocardial infarction, or ventricular arrhythmia. The safety of Zytiga in patients with left ventricular ejection fraction $< 50\%$ or NYHA Class III or IV heart failure has not been established because these patients were excluded from the randomized clinical trial. Monitor patients for hypertension, hypokalemia, and fluid retention at least once a month. Control hypertension and correct hypokalemia before and during treatment with Zytiga.

TABLE 1

Overall Survival of Patients Treated with Either Zytiga or Placebo in Combination with Prednisone (Intent-to-Treat Analysis)		
	ZYTIGA PLUS PREDNISONE (N=797)	PLACEBO PLUS PREDNISONE (N=398)
PRIMARY SURVIVAL ANALYSIS		
Deaths (%)	333 (42%)	219 (55%)
Median survival (months) (95% CI)	14.8 (14.1-15.4)	10.9 (10.2-12.0)
P Value	< 0.0001	
Hazard ratio (95% CI)	0.646 (0.543-0.768)	
UPDATED SURVIVAL ANALYSIS		
Deaths (%)	501 (63%)	274 (69%)
Median survival (months) (95% CI)	15.8 (14.8-17.0)	11.2 (10.4-13.1)
Hazard ratio (95% CI)	0.740 (0.638-0.859)	



Adrenocortical insufficiency has been reported in clinical trials in patients receiving Zytiga in combination with prednisone, following interruption of daily steroids and/or with concurrent infection or stress. Use caution and monitor for symptoms and signs of adrenocortical insufficiency, particularly if patients are withdrawn from prednisone, have prednisone dose reductions, or experience unusual stress. Symptoms and signs of adrenocortical insufficiency may be masked by adverse reactions associated with mineralocorticoid excess seen in patients treated with Zytiga. If clinically indicated, perform appropriate tests to confirm the diagnosis of adrenocortical insufficiency. Increased dosage of corticosteroids may be indicated before, during, and after stressful situations.

Marked increases in liver enzymes leading to drug discontinuation or dosage modification have occurred. Measure serum transaminases (ALT and AST) and bilirubin levels prior to starting treatment with Zytiga, every 2 weeks for the first 3 months of treatment and monthly thereafter. In patients with baseline moderate hepatic impairment receiving a reduced Zytiga dose of 250 mg, measure ALT, AST, and bilirubin prior to the start of treatment, every week for the first month, every 2 weeks for the following 2 months of treatment and monthly thereafter. Promptly measure serum total bilirubin, AST, and ALT if clinical symptoms or signs suggestive of hepatotoxicity develop. Elevations of AST, ALT, or bilirubin from the patient's baseline should prompt more frequent monitoring. If at any time AST or ALT rise above 5 times the upper limit of normal (ULN), or the bilirubin rises above 3 times the ULN, interrupt Zytiga treatment and closely monitor liver function.

Retreatment with Zytiga at a reduced dose level may take place only after return of liver function tests to the patient's baseline or to AST and ALT less than or equal to 2.5 times ULN and total bilirubin less than or equal to 1.5 times ULN.

The safety of Zytiga retreatment of patients who develop AST or ALT greater than or equal to 20 times ULN and/or bilirubin greater than or equal to 10 times ULN is unknown.

Food Effect

Zytiga must be taken on an empty stomach. No food should be consumed for at least 2 hours before the dose of Zytiga is taken and for at least 1 hour after the dose of Zytiga is taken. Abiraterone C_{max} and AUC_{0-∞} (exposure) were increased up to 17- and 10-fold higher, respectively, when a single dose of abiraterone acetate was administered with a meal compared to a fasted state. The safety of these increased exposures when multiple doses of abiraterone acetate are taken with food has not been assessed.

Clinical Trials

Because clinical trials are conducted under widely varying condi-

tions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared with rates in the clinical trials of another drug and may not reflect the rates observed in clinical practice.

In a placebo-controlled, multicenter phase 3 clinical trial of patients with metastatic castration-resistant prostate cancer who were using a gonadotropin-releasing hormone (GnRH) agonist or were previously treated with orchiectomy, Zytiga was administered at a dose of 1,000 mg daily in combination with prednisone 5 mg twice daily in the active treatment arm (n=791). Placebo plus prednisone 5 mg twice daily was given to control patients (n=394). The median duration of treatment with Zytiga was 8 months.

The most common adverse drug reactions (≥5%) reported in clinical studies were joint swelling or discomfort, hypokalemia, edema, muscle discomfort, hot flush, diarrhea, urinary tract infection, cough, hypertension, arrhythmia, urinary frequency, nocturia, dyspepsia and upper respiratory tract infection.

The most common adverse drug reactions that resulted in drug discontinuation were aspartate aminotransferase increased, alanine aminotransferase increased, urosepsis and cardiac failure (each in <1% of patients taking Zytiga).

Adverse reactions and laboratory abnormalities related to mineralocorticoid effects were reported more commonly in patients treated with Zytiga than in patients treated with placebo: hypokalemia 28% vs 20%, hypertension 9% vs 7% and fluid retention (edema) 27% vs 18%, respectively. In patients treated with Zytiga, grades 3 to 4 hypokalemia occurred in 5% of patients and grades 3 to 4 hypertension was reported in 1% of patients.

Cardiovascular adverse reactions in the phase 3 trial included arrhythmias, ischemia, and myocardial infarction. The majority of arrhythmias were grade 1 or 2. Grade 3-4 arrhythmias occurred at similar rates in the two arms. There was one death associated with arrhythmia and one patient with sudden death in the Zytiga arm. No patients had sudden death or arrhythmia associated with death in the placebo arm. Cardiac ischemia or myocardial infarction led to death in 2 patients in the placebo arm and 1 death in the Zytiga arm. Cardiac failure resulting in death occurred in 1 patient on both arms.

Drug-associated hepatotoxicity with elevated ALT, AST, and total bilirubin has been reported in patients treated with Zytiga. Across all clinical trials, liver function test elevations (ALT or AST increases of >5 times ULN) were reported in 2.3% of patients who received Zytiga, typically during the first 3 months after starting treatment. In the phase 3 trial, patients whose baseline ALT or AST were elevated were more likely to experience liver function test elevations than those beginning with normal values. When elevations of either ALT or AST > 5X ULN, or elevations in bilirubin >3 times ULN were observed, Zytiga was withheld or discontinued. In two instances, marked increases in liver func-



tion tests occurred. These two patients with normal baseline hepatic function, experienced ALT or AST elevations 15 to 40 times ULN and bilirubin elevations 2 to 6 times ULN. Upon discontinuation of Zytiga, both patients had normalization of their liver function tests and one patient was retreated with Zytiga without recurrence of the elevations.

In clinical trials, the following patients were excluded: patients with active hepatitis, patients with baseline ALT and/or AST ≥ 2.5 times ULN in the absence of liver metastases, and patients with ALT and/or AST >5 times ULN in the presence of liver metastases. Abnormal liver function tests developing in patients participating in clinical trials were managed by treatment interruption, dose modification and/or discontinuation. Patients with elevations of ALT or AST >20 time ULN were not retreated.

Adrenal insufficiency occurred in two patients on the abiraterone arm of the phase 3 clinical trial ($<1\%$).

Laboratory values of interest from the phase 3 placebo-controlled clinical trial included grade 3-4 low serum phosphate (7.2%) and potassium (5.3%), which occurred more frequently in the Zytiga arm.

Drug Interactions

Zytiga is an inhibitor of the hepatic drug-metabolizing enzyme CYP2D6. In a CYP2D6 drug-drug interaction trial, the C_{max} and AUC of dextromethorphan (CYP2D6 substrate) were increased 2.8- and 2.9-fold, respectively, when dextromethorphan was given with abiraterone acetate 1,000 mg daily and prednisone 5 mg twice daily. Avoid coadministration of abiraterone acetate with substrates of CYP2D6 with a narrow therapeutic index (eg, thioridazine). If alternative treatments cannot be used, exercise caution and consider a dose reduction of the concomitant CYP2D6 substrate drug.

Based on in vitro data, Zytiga is a substrate of CYP3A4. The effects of strong CYP3A4 inhibitors (eg, ketoconazole, itraconazole, clarithromycin, atazanavir, nefazodone, saquinavir, telithromycin, ritonavir, indinavir, nelfinavir, voriconazole) or inducers (eg, phenytoin, carbamazepine, rifampin, rifabutin, rifapentine, phenobarbital) on the pharmacokinetics of abiraterone have not been evaluated in vivo. Avoid or use with caution, strong inhibitors and inducers of CYP3A4 during Zytiga treatment.

In vitro studies with human hepatic microsomes showed that abiraterone is a strong inhibitor of CYP1A2 and CYP2D6 and a moderate inhibitor of CYP2C9, CYP2C19, and CYP3A4/5.

In an in vivo drug-drug interaction trial, the C_{max} and AUC of dextromethorphan (CYP2D6 substrate) were increased 2.8- and 2.9-fold, respectively when dextromethorphan 30 mg was given with abiraterone acetate 1,000 mg daily (plus prednisone 5 mg twice daily). The AUC for dextromethorphan, the active metabolite of dextromethorphan, increased approximately 1.3-fold.

In a clinical study to determine the effects of abiraterone acetate 1,000 mg daily (plus prednisone 5 mg twice daily) on a single 100 mg dose of the CYP1A2 substrate theophylline, no increase in systemic exposure of theophylline was observed.

Abiraterone is a substrate of CYP3A4, in vitro. The effects of strong CYP3A4 inhibitors or inducers on the pharmacokinetics of abiraterone have not been evaluated in vivo. Strong inhibitors and inducers of CYP3A4 should be avoided or used with caution.

Use in specific populations

Pregnancy Category X

Zytiga is not indicated for use in women. It is not known if abiraterone acetate is excreted in human milk. Because many drugs are excreted in human milk, and because of the potential for serious adverse reactions in nursing infants from Zytiga, a decision should be made to either discontinue nursing, or discontinue the drug taking into account the importance of the drug to the mother.

Zytiga is not indicated in children.


Of the total number of patients in a phase 3 study of Zytiga, 71% of patients were 65 years and over and 28% were 75 years and over. No overall differences in safety or effectiveness were observed between these elderly patients and younger patients.

The pharmacokinetics of abiraterone were examined in subjects with baseline mild (n=8) or moderate (n=8) hepatic impairment (Child-Pugh Class A and B, respectively) and in 8 healthy control subjects with normal hepatic function. The systemic exposure (AUC) of abiraterone after a single oral 1,000 mg dose of Zytiga increased by approximately 1.1-fold and 3.6-fold in subjects with mild and moderate baseline hepatic impairment, respectively compared to subjects with normal hepatic function.

No dosage adjustment is necessary for patients with baseline mild hepatic impairment. In patients with baseline moderate hepatic impairment (Child-Pugh Class B), reduce the recommended dose of Zytiga to 250 mg once daily. If elevations in ALT or AST >5 times ULN or total bilirubin >3 times ULN occur in patients with baseline moderate hepatic impairment, discontinue ZYTIGA treatment.

The safety of Zytiga in patients with baseline severe hepatic impairment has not been studied. These patients should not receive Zytiga.

For patients who develop hepatotoxicity during treatment, interruption of treatment and dosage adjustment may be required.

In a dedicated renal impairment trial, the mean PK parameters were comparable between healthy subjects with normal renal function (n=8) and those with end stage renal disease (ESRD) on hemodialysis (n=8) after a single oral 1,000 mg dose of Zytiga. No dosage adjustment is necessary for patients with renal impairment. 



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J Am Soc Nephrol. 2011 May 12. [Epub ahead of print]

Rosuvastatin in diabetic hemodialysis patients.

Holdaas H, Holme I, Schmieder RE, et al; on behalf of the AURORA study group.

ABSTRACT: A randomized, placebo-controlled trial in diabetic patients receiving hemodialysis showed no effect of atorvastatin on a composite cardiovascular endpoint, but analysis of the component cardiac endpoints suggested that atorvastatin may significantly reduce risk. Because the AURORA (A Study to Evaluate the Use of Rosuvastatin in Subjects on Regular Hemodialysis: An Assessment of Survival and Cardiovascular Events) trial included patients with and without diabetes, we conducted a post hoc analysis to determine whether rosuvastatin might reduce the risk of cardiac events in diabetic patients receiving hemodialysis. Among the 731 participants with diabetes, traditional risk factors such as LDL-C, smoking, and BP did not associate with cardiac events (cardiac death and nonfatal myocardial infarction). At baseline, only age and high-sensitivity C-reactive protein were independent risk factors for cardiac events. Assignment to rosuvastatin associated with a nonsignificant 16.2% reduction in risk for the AURORA trial's composite primary endpoint of cardiac death, nonfatal MI, or fatal or nonfatal stroke (HR, 0.84; 95% CI 0.65-1.07). There was no difference in overall stroke, but the rosuvastatin group had more hemorrhagic strokes than the placebo group (12 versus two strokes, respectively; HR, 5.21; 95% CI 1.17-23.27). Rosuvastatin treatment significantly reduced the rates of cardiac events by 32% among patients with diabetes (HR, 0.68; 95% CI 0.51-0.90). In conclusion, among hemodialysis patients with diabetes mellitus, rosuvastatin might reduce the risk of fatal and nonfatal cardiac events.

Department of Nephrology, Oslo University Hospital, Rikshospitalet, Oslo, Norway.

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[Epub ahead of print]

Risk of cardiovascular events after infection-related hospitalizations in older patients on dialysis.

Dalrymple LS, Mohammed SM, Mu Y, et al.

BACKGROUND AND OBJECTIVES: Infection and cardiovascular disease are leading causes of hospitalization and death in patients on dialysis. The objective of this study was to determine whether an infection-related hospitalization increased the short-term risk of a cardiovascular event in older patients on dialysis. **DESIGN, SETTING, PARTICIPANTS, & MEASUREMENTS:** With use of the United States Renal Data System, patients aged 65 to 100 years who started dialysis between January 1, 2000, and December 31, 2002, were examined. All hospitalizations were examined from study entry until time of transplant, death, or December 31, 2004. All discharge diagnoses were examined to determine if an infection occurred during hospitalization. Only principal discharge diagnoses were examined to ascertain cardiovascular events of interest. We used the self-controlled case-series method to estimate the relative incidence of a cardiovascular event within 90 days after an infection-related hospitalization as compared with other times not within 90 days of such a hospitalization. **RESULTS:** A total of 16,874 patients had at least 1 cardiovascular event and were included in the self-controlled case-series analysis. The risk of a cardiovascular event was increased by 25% in the first 30 days after an infection and was overall increased 18% in the 90 days after an infection-related hospitalization relative to control periods. **CONCLUSIONS:** The first 90 days, and in particular the first 30 days, after an infection-related hospitalization is a high-risk period for cardiovascular events and may be an important timeframe for cardiovascular risk reduction, monitoring, and intervention in older patients on dialysis.

Ann Pharmacother. 2011 Jan;45(1):39-48. Epub 2011 Jan 4.

Effectiveness of pharmacist care in the improvement of adherence to antidepressants: a systematic review and meta-analysis.

Rubio-Valera M, Serrano-Blanco A, Magdalena-Belfo J, et al.

BACKGROUND: Pharmacists can play a decisive role in the management of ambulatory patients with depression who have poor adherence to antidepressant drugs. **OBJECTIVE:** To systematically evaluate the effectiveness of pharmacist care in improving adherence of depressed outpatients to antidepressants. **METHODS:** A systematic review and meta-analysis of randomized controlled trials (RCTs) was conducted. RCTs were identified through electronic databases (MEDLINE, Cochrane Central Register of Controlled Trials, Institute for Scientific Information Web of Knowledge, and Spanish National Research Council) from inception to April 2010, reference lists were checked, and experts were consulted. RCTs that evaluated the impact of pharmacist interventions on improving adherence to antidepressants in depressed patients in an outpatient setting (community pharmacy or pharmacy service) were included. Methodologic quality was assessed and methodologic details and outcomes were extracted in duplicate. **RESULTS:** Six RCTs were identified. A total of 887 patients with an established diagnosis of depression who were initiating or maintaining pharmacologic treatment with antidepressant drugs and who received pharmacist care (459 patients) or usual care (428 patients) were included in the review. The most commonly reported interventions were patient education and monitoring, monitoring and management of toxicity and adverse effects, adherence promotion, provision of written or visual information, and recommendation or implementation of changes or adjustments in medication. Overall, no statistical heterogeneity or publication bias was detected. The pooled odds ratio, using a random effects model, was 1.64 (95% CI 1.24-2.17). Subgroup analysis showed no statistically significant differences in results by type of pharmacist involved, adherence measure, diagnostic tool, or analysis strategy. **CONCLUSIONS:** These results suggest that pharmacist intervention is effective in the improvement of patient adherence to antidepressants. However, data are still limited and we would recommend more research in this area, specifically outside of the US.

Research and Development Unit, Fundació Sant Joan de Déu, Sant Boi de Llobregat, Barcelona, Spain.

Ann Surg. 2011 May 20. [Epub ahead of print]

A multivariate analysis of pre-, peri-, and posttransplant factors affecting outcome after pediatric liver transplantation.

McDiarmid SV, Anand R, Martz K, Millis MJ, Mazariegos G.

OBJECTIVE: The purpose of this study was to identify significant, independent factors that predicted 6-month patient and graft survival after pediatric liver transplantation. **SUMMARY BACKGROUND DATA:** The Studies of Pediatric Liver Transplantation (SPLIT) is a multicenter database established in 1995, of currently more than 4000 US and Canadian children undergoing liver transplantation. Previous published analyses from this data have examined specific factors influencing outcome. This study analyzes a comprehensive range of factors that may influence outcome from the time of listing through the peri- and postoperative period. **METHODS:** A total of 42 pre-, peri- and posttransplant variables evaluated in 2982 pediatric recipients of a first liver transplant registered in SPLIT significant at the univariate level were included in multivariate models. **RESULTS:** In the final model combining all baseline and posttransplant events, posttransplant complications had the highest relative risk of death or graft loss. Reoperation for any cause increased the risk for both patient and graft loss by 11 fold and reoperation exclusive of specific complications by 4 fold. Vascular thromboses, bowel perforation, septicemia, and retransplantation, each independently increased the risk of patient and graft loss by 3 to 4 fold. The only baseline factor with a similarly high relative risk for patient and graft loss was recipient in the intensive care unit (ICU) intubated at transplant. A significant center effect was also found but did not change the impact of the highly significant factors already identified. **CONCLUSIONS:** We conclude that the most significant factors predicting patient and graft loss at 6 months in children listed for transplant are posttransplant surgical complications.

Department of Pediatrics and Surgery, University of California, Los Angeles; Biostatistics, The Emmes Corporation, Rockville, Maryland; Department of Surgery, University of Chicago, Chicago, Illinois; and Department of Surgery, Children's Hospital of Pittsburgh, Pittsburgh, Pennsylvania. The SPLIT Research Group. ►

Ann Surg Oncol. 2011 Jan;18(1):146-52. Epub 2010 Aug 24.

Significance of lymph node retrieval from the terminal ileum for patients with cecal and ascending colonic cancers.

Lan YT, Lin JK, Jiang JK, Chang SC, Liang WY, Yang SH.

BACKGROUND: For patients with cecal and ascending colonic cancers, the significance of regional lymph node (LN) metastasis at the terminal ileum has not been elucidated. We analyzed its metastatic patterns and significance. **METHODS:** The records of patients with cecal and ascending colonic cancers receiving standard radical right hemicolectomy with D3 LN dissection between 2000 and 2010 were collected. The regional LNs were grouped according to the Japanese Classification of Colorectal Carcinoma. The regional LNs supplied by ileocolic vessels were further divided into 201-A (terminal ileal side) and 201-B (colonic side). The clinicopathologic characteristics of all cases showing positive for metastasis in 201-A LN were analyzed. **RESULTS:** Forty-seven cases of cecal and 56 cases of ascending colonic cancer were included. Seven cases had 201-A-positive LNs: five (10.6%) in cecal cancers and two (3.6%) in ascending colonic cancers. They all had distant metastases ($P < 0.001$), and the incidences were significantly correlated with the numbers of metastatic LNs ($P < 0.05$). There was no 201-A-positive LN noted among patients with stage I to III disease. Poor prognosis was noted for patients with a 201-A-positive LN. **CONCLUSIONS:** Both cecal and ascending colonic cancers have a potential for LN metastasis at the terminal ileum. These cases are exclusively stage IV and have poor prognosis.

Division of Colon and Rectal Surgery, Department of Surgery, Taipei Veterans General Hospital, Taipei, Taiwan.

Cancer. 2011 Mar 15;117(6):1296-301. doi: 10.1002/cncr.25573. Epub 2010 Nov 8.

Timing of administration of bevacizumab chemotherapy affects wound healing after chest wall port placement.

Erinjeri JP, Fong AJ, Kemeny NE, Brown KT, Getrajdman GI, Solomon SB.

BACKGROUND: The authors investigated how the timing of administration of bevacizumab, a targeted vascular endothelial growth factor-inhibiting chemotherapeutic agent, affected the risk of wound healing in patients undergoing chest wall port place-

ment. **METHODS:** The authors performed a retrospective search was performed of an institutional review board approved, Health Insurance Portability and Accountability Act compliant database between 2002 and 2008, identifying 1108 port placements in patients who were treated with bevacizumab. One hundred twenty of these ports eventually required explant. Data analyzed included patient demographics, indication for port removal, and schedule of bevacizumab therapy. **RESULTS:** Wound healing complications requiring port explant were seen in 0.9% of placements (10/1108). When bevacizumab was given within 1 day of port placement, the absolute risk (AR) of port removal for wound dehiscence was 2.4% (2/82), compared with 0.3% (3/1021) when 2 or more days had passed between port placement and bevacizumab administration, yielding a statistically significant relative risk (RR) of 8.1 ($P < .02$). Similarly, when bevacizumab was administered within 7 days of port insertion, there was a significant RR of dehiscence-related port explant (AR 1.4% vs 0.1%, RR 11.5, $P < .028$). However, no significant RR for dehiscence-related port removal was observed when bevacizumab was administered within 14 days (AR 0.9% vs 0.2%, RR 6.2, $P < .09$) or 30 days (AR 0.7% vs 0.2%, RR 3.7, $P < .23$) of port placement. **CONCLUSIONS:** The risk of a wound dehiscence requiring chest wall port explant in patients treated with bevacizumab was inversely proportional to the interval between bevacizumab administration and port placement, with significantly higher risk seen when the interval is less than 14 days.

Interventional Radiology Service, Memorial Sloan-Kettering Cancer Center, New York, New York.

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Interleukin 22 serum levels are associated with radiographic progression in rheumatoid arthritis.

Leipe J, Schramm MA, Grunke M, et al.

OBJECTIVES: To study the role of interleukin 22 (IL-22) in rheumatoid arthritis (RA). **METHODS:** IL-22 serum levels were measured in patients with early, treatment-naive RA ($n = 49$) and in 45 age- and sex-matched healthy individuals as controls. Patients were assessed clinically and radiographically at baseline and followed up for 2 years. Correlations of IL-22 serum levels were sought with parameters of disease activity, serological markers, demographic factors and the incidence of erosions. IL-22 production by peripheral blood T cells was investigated by intracellular flow cytometry. **RESULTS:** 24 of 49 patients with RA demonstrated elevated IL-22 levels compared with the range of healthy controls. At baseline, a high

percentage of these patients (8/24, 33%) demonstrated bone erosions, whereas only 1 patient (4%) from the group with normal IL-22 had erosions. During the 2 years of follow-up, 6 additional patients with increased IL-22 at baseline developed erosions. In contrast, none of the patients in whom IL-22 levels were normal developed erosions despite similar treatment regimens. Multivariate regression analysis accounting for other parameters predictive for erosions, such as the presence of rheumatoid factor or anti-cyclic citrullinated peptide antibodies and disease activity, showed that elevated IL-22 baseline levels were independently and significantly associated with erosive RA. Cellular analysis demonstrated enhanced expression of IL-22 from CD4 T cells in RA. **CONCLUSION:** IL-22 is elevated in the serum of half of the patients with RA. Elevated serum IL-22 allows discrimination between patients with different radiographic progression and indicates a possible involvement of IL-22 in the pathophysiology of RA.

Division of Rheumatology, Medizinische Poliklinik, University of Munich, Munich, Germany.

Breast Cancer Res Treat. 2011 Mar 9. [Epub ahead of print]

Inflammatory breast cancer: high risk of contralateral breast cancer compared to comparably staged non-inflammatory breast cancer.

Schairer C, Brown LM, Mai PL.

ABSTRACT: Inflammatory breast cancer (IBC), the most lethal form of breast cancer, has characteristics linked to higher risk of contralateral breast cancer. However, no large studies have examined risk of contralateral breast cancer following IBC. We calculated absolute risk of invasive contralateral breast cancer among 5,631 IBC and 174,634 comparably staged non-IBC first breast cancer cases who survived at least 2 months following diagnosis and were reported to 13 Surveillance, Epidemiology, and End Results (SEER) registries between January 1, 1973 and December 31, 2006. We considered that contralateral cancers occurring within 2 to 23 months of first cancer diagnosis may more likely be metastatic/recurrent disease and those occurring 2 or more years after diagnosis, independent primaries. Absolute risk of contralateral breast cancer was generally greater following IBC than regional/distant non-IBC, regardless of age and hormone receptor status of first cancer diagnosis. Much of the increase in absolute risk following IBC occurred within 2 to 23 months of first cancer diagnosis, while the risk for non-IBC

occurred more gradually over time since diagnosis. For instance, among women first diagnosed before age 50, absolute risks following IBC and non-IBC were 4.9 vs 1.1% at 2 years, 6.0 vs 2.2% at 5 years, and 7.7 vs 6.1% at 20 years after diagnosis. However, patterns of higher risk following IBC than non-IBC were also evident for at least 10 to 15 years in the subcohort of women who survived at least 24 months without a contralateral cancer. In conclusion, our results suggest that IBC has higher risk of cancer in the contralateral breast than comparably staged non-IBC, possibly due to both metastatic/recurrent disease and independent primaries.

Division of Cancer Epidemiology and Genetics, Department of Health and Human Services, National Cancer Institute, National Institutes of Health, Rockville, Maryland.

J Asthma. 2011 May 23. [Epub ahead of print]

Impact of obesity on the severity and therapeutic responsiveness of acute episodes of asthma.

Yeh KH, Skowronski ME, Coreno AJ, et al.

BACKGROUND: It has been suggested that obesity adversely influences both the severity and the therapeutic responsiveness of chronic asthma. However, it is unclear if it also impacts acute situations. **METHODS:** To determine whether adiposity worsens the clinical and physiological manifestations of acute asthma and limits therapeutic effectiveness of standard treatment, we contrasted signs, symptoms, medication use, arterial oxygen saturation, peak expiratory flow rate, and the bronchodilator response to standard doses of albuterol in 90 nonobese and 90 obese asthmatics as they presented for urgent care. Treatment and clinical decisions were systematized using published care paths and the peak flow was measured with standard techniques. Body mass index (BMI) was calculated according to consensus criteria. **RESULTS:** Other than BMI ($P < .001$), there were no between-group differences in age, gender, race, signs, symptoms, pulse oximetry, or pre-presentation medication use. The pre-treatment peak flow in the obese population was 22.4% higher on average ($P = .007$), but there were no differences in the distribution of severity ($P = .38$), the response to albuterol ($P = .61$), or admission-discharge ratios ($P = .62$). **CONCLUSIONS:** Obesity does not adversely influence the severity or the resolution of acute episodes of asthma.

Case Western Reserve University School of Medicine, Cleveland, Ohio. ■

Adults With Autism Spectrum Disorder *continued from page 3*

another MSS site, located in Brooklyn Park, Minnesota, and plans are underway to incorporate some of these techniques at the St. Paul site, where a supported employment program and several community work sites are currently employing individuals with ASD. Future expansion plans also include offering specialized vocational rehabilitation services for individuals on the higher functioning ranges of the spectrum and individuals with Asperger's Syndrome. MSS' more traditional and currently CARF-accredited vocational rehabilitation services will be modified to address the specialized needs of these individuals and will also include a social skills group component. The social skills group will be designed to assist the participants as they learn to better understand the social environments associated with postsecondary education and the workplace to greatly increase their likeliness of success. **CM**

For further information about Midwest Special Services, Inc., please contact Anna MacIntyre, Director, Rehabilitation Services, at 651-778-1000 (main) or 651-793-4118 (direct).

Paying It Forward Through Mentoring *continued from page 6*

group on LinkedIn.com to promote networking and sharing of knowledge. Through social media, practitioners of all levels have the opportunity to establish informal mentoring, by asking questions related to the field and developing greater comfort and skill with technology applications.

As experienced professionals and new entrants to the field meet and mingle, whether in person at a conference or in an online environment, connections will be made. This also opens the door for more formal mentoring to be established. For both parties, it takes commitment not only to each other but

Revised Standards of Practice for Case Management: Ethical Issues *continued from page 4*

seats. Patients' choices "trump!"

Like Informed Consent

It may be helpful to compare the process of choosing postacute providers with obtaining informed consent from patients for surgery. If patients with mental capacity are unwilling or unsure about giving consent, case managers cannot simply choose for them!

As evidenced from the above standards, case managers are also required to maintain respectful relationships with coworkers, employers, and other professionals. This requirement clearly applies to providers to whom case managers make referrals. Anecdotal accounts of how case managers in positions to make referrals treat postacute providers are difficult to hear. Such conduct clearly violates applicable national Standards of care described above.

Stay tuned for more about revised national Standards of care. **CM**

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also to the process itself. Mentors must be committed to leadership, helping to develop leaders for the next generation and adding value to other people's lives. Being a mentor also requires time and a willingness to be involved.

Mentees must be committed to the mentoring relationship, to devote the necessary time, and to be serious about developing one's skills and talent. And, one day remembering the mentoring they received, mentees must reach out to others who come behind them—to pay forward the benefits that they have received. **CM**

The CDMS Commission is the only independent and nationally accredited organization that certifies disability management specialists.

The Role of the Professional Case Manager in New Models of Care Delivery *continued from page 5*

PCMH is critical. Care coordination, which is a central role of the professional case manager, provides access to the right care and treatment resources at the right time, avoiding duplication and unnecessary use of resources.

The link between care coordination and improved outcomes calls for use of qualified, board-certified professional case managers within models such as the PCMH. By utilizing the skills and expertise of such highly qualified case managers, physicians are able to extend their reach across a larger population of patients, improve quality, pursue health status improvements in patients, and elevate the purpose of the PCMH. These positive outcomes are at the heart of the goals of health care reform.

As primary care physicians and other clinicians and providers join forces in pursuit of significant, measurable improvements in the quality of care delivery, they must examine the strengths of each link in the chain of the network being established. A board-certified, professional case manager is a strong contributor to the network, with proven competencies to achieve the goals that are integral to PCMH success. **CM**

The Commission for Case Manager Certification (www.ccmcertification.org) is the first and largest nationally accredited organization that has certified more than 30,000 professional case managers. The Commission is a nonprofit, volunteer organization that oversees the process of case manager certification with its CCM® credential. The Commission is positioned as the most active and prestigious certification organization supporting the case management.

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Editor-in-Chief: Gary S. Wolfe, RN, CCM
831-443-6847; e-mail: gswolfe@aol.com

Executive Editor: Jennifer Maybin, MA, ELS
203-454-1333, ext. 3;
e-mail: jennifer@jmaybin.com

Publisher/President: Howard Mason, RPH,
MS; 203-454-1333, ext. 1;
e-mail: hmason@academycm.org

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Website: www.jcaremanagement.com

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phone: 203-454-1333; fax: 203-227-9495
Website: www.academycm.org

Executive Vice President:

Gary S. Wolfe, RN, CCM · 831-443-6847;
e-mail: gswolfe@aol.com

Member Services:

203-454-1333, ext. 3
e-mail: hmason@academycm.org

The Role of the Professional Case Manager in New Models of Care Delivery continued from page 28

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