

Provider Update

Volume 25, Issue 3

May/June 2008

DHH Offers Health Coverage Through Separate State SCHIP

The Department of Health and Hospitals has expanded coverage of its Louisiana Children's Health Insurance Program (LaCHIP) to include non-Medicaid benefactors whose services will be administered through the state Office of Group Benefits (OGB). The new program, LaCHIP Affordable Plan, is not a Medicaid expansion program like the current LaCHIP, but instead provides health care services separate from Medicaid and SCHIP.

LaCHIP Affordable Plan is only available to children in families with income between 200 and 250 percent of the Federal Poverty Level. These children are not eligible for Medicaid or the state's regular SCHIP. Children who lose their LaCHIP or Medicaid eligibility because of an income increase may now be eligible for benefits through the LaCHIP Affordable Plan.

Children with LaCHIP Affordable Plan coverage will not have an active Medicaid card, but will instead have an Office of Group Benefits Preferred Provider Organization (OGB PPO) benefits ID card. Services, billing and management for LaCHIP Affordable Plan will all be maintained by OGB. Medical care will be provided through the OGB PPO Network of doctors and will include benefits similar to those available to state employees through the OGB PPO plan.

LaCHIP Affordable Plan enrollees will be required to pay a \$50 monthly premium (per family) as well as co-payments to access services. There is no deductible for primary care services, but there is a \$200 mental health deductible. All eligible applicants must be uninsured for the previous 12 months unless loss of insurance was involuntary.

For more information about LaCHIP and the program's expansion, visit www.lachip.org and click on the link at the top of the page. You can also call 1-877-2LaCHIP (252-2447).

Table of Contents

<i>DHH Health Coverage and SCHIP</i>	1	<i>Change in Reimbursement Methodology for Case Management</i>	5
<i>Information Required on Physician Administered Drugs</i>	2	<i>RA Corner</i>	5
<i>CommunityCARE and Outpatient Visit Limits</i>	3	<i>LADUR Educational Article</i>	7
<i>CMS Rule on Electronic-Prescribing Standards under Medicare Prescription Drug Benefit</i>	4		

Professional Service Providers and Outpatient Hospitals and Hemodialysis Centers

Information Required on Physician Administered Drugs

This article addresses additional information for providers who submit claims on the UB-04 claim form and reinforces information that was covered in the March-April Provider Update.

A new federal statute mandates that providers must begin reporting National Drug Code (NDC) information for all physician-administered drugs* on claim submissions. Physician-administered drugs include any drugs ordered by a doctor (or APRN with prescriptive authority), regardless of which clinical professional actually administers the drug. This requirement applies to both electronic and hard copy claims.

Effective with date of service March 1, 2008, physicians, physician groups, advanced practice registered nurses (APRNs), and physician assistant providers are required to submit NDC information and the corresponding HCPCS code for physician-administered drugs on the 837P (Professional transaction) and the CMS-1500 claim form. Billing instructions for the CMS-1500 claim form are located on the LA Medicaid web site, www.lamedicaid.com, under the Training link - 2007 Training Packets and under the Billing Information link. The LA Medicaid EDI Companion Guide for the 837P has been revised (2/2008) to include this information for EDI billing and the revision is available on the web site. The guide can be found under the link, HIPAA Billing Instructions and Companion Guides.

Effective with processing date May 23, 2008, for dates of service on or after March 1, 2008, outpatient hospitals and hemodialysis centers are required to submit NDC information and the corresponding HCPCS code for physician-administered drugs on the 837I (Institutional transaction) and the UB-04 claim form. Updated billing instructions for the UB-04 form are also located on the LA Medicaid web site under the Billing Information link and the New Medicaid Information link. Updated billing instructions for licensed hemodialysis centers are forthcoming. Please monitor future RA messages which will inform providers when these instructions are placed on the LA Medicaid website. The revised EDI Companion Guide for the 837I is available on the web site and includes this information for EDI billing.

This means that any LA Medicaid covered service submitted with a HCPCS procedure code for a physician administered drug must be accompanied by the actual NDC code from the package of the drug administered and other required information. The information must be entered on the claim submission EXACTLY as indicated in the billing instructions to prevent future claim denials. This change **does not include** prescriptions written for patients by physicians. The information required in these cases will be reported by the pharmacy filling the prescription for the patient. Please consult your clinical professionals if you have questions concerning drugs that should have NDC information reported, as it will be present on the packaging of the drug.

Providers, vendors, billing agents, and clearinghouses must immediately begin updating their billing systems to accommodate this mandate.

Effective with date of service March 1, 2008, new claims processing edits were implemented as educational edits for professional providers. These educational edits will become effective for outpatient hospital and hemodialysis providers on the RA dated May 27, 2008.

Effective with date of processing July 1, 2008, these edits will become denial edits for professional claims, outpatient hospital claims, and hemodialysis claims. Claims that do not contain the required, accurate NDC information submitted as directed in the billing instructions will deny.

Professional Service Providers and Outpatient Hospitals and Hemodialysis Centers (cont.)

These edits are:

Edit 120 - "Quantity Invalid/Missing"
Edit 127 - "NDC Code Missing or Incorrect"
Edit 231 - "NDC Code Not on File"

Current claims history indicates that many professional claims are being submitted with the required data either missing or entered incorrectly on the claim. Once these edits become denial edits, any claims with incorrectly entered data will deny. Please review the entry of this information and ensure that it is correct and complete.

With the implementation of this mandate, physician administered drug claims will be invoiced to drug manufacturers for Medicaid rebates. Louisiana Medicaid may need to audit or review these claims if requested by the drug manufacturers or if any outlier billings are detected. Each provider must retain all records for five (5) years from the date of service or until all audit questions, disputes, or review issues are concluded. At times, a drug manufacturer may question the invoice amount, which results in a drug rebate dispute. If this occurs, we may contact you to request a copy of your office records including documentation pertaining to the billed HCPCS/NDC code. Requested records may include drug/NDC invoices indicating purchase of drugs and documentation showing what drug (name, strength, and amount) was administered to the Medicaid patient and on what date; verification/certification of the units billed on the claim(s); and copies of the labels from the drug packages.**

*Physician-administered drugs include any drugs ordered by a doctor (or APRN with prescriptive authority), regardless of which clinical professional actually administers the drug.

**These items are examples of what the provider may present as proof of the NDC used. If the provider has the invoice records, then copies of the labels from the drug packages are not necessary. If the provider has a bottle or box of the drug in question on hand, then a copy of the label may be requested by the Medicaid staff, but DHH is not requiring providers to copy all labels and keep them on file.

NOTE: Rural Health Clinics, Federally Qualified Health Centers, and Mental Health Clinics are not included in the implementation of this mandate.

Professional Services Providers

CommunityCARE and Outpatient Visit Limits

Medicaid enrollees age 21 and older are limited to 12 medically necessary physician/clinic visits per calendar year. If a CommunityCARE enrollee has used all 12 annual visits and is in need of non-emergent care, the primary care provider (PCP) has several options:

- Either treat the enrollee and not bill Medicaid;
- Offer to see the enrollee as a private pay patient (enrollee pays out of pocket);
- Provide care to the enrollee and request an extension of visits; if he/she feels the enrollee's medical condition meets the criteria for an extension of visits (treatment would be life saving or life sustaining).

Professional Services Providers (continued)

If the PCP does not feel that the condition meets the criteria for an extension and the enrollee is unable or unwilling to pay out of pocket, the PCP should be willing to issue a referral/authorization so the enrollee may receive care from another provider who may be willing to see the enrollee even though all 12 visits have been used.

Questions regarding CommunityCARE policy should be directed to Unisys Provider Relations at (800) 473-2783, or the CommunityCARE Hotline at (800) 259-4444.

Professional Services and Pharmacy Providers

CMS Issues Final Rule on Electronic-Prescribing Standards under Medicare Prescription Drug Benefit

The following appeared on the Kaiser Website on April 3, 2008.

CMS released a final rule on Wednesday, April 2, 2008, that establishes standards for electronic prescribing under the Medicare prescription drug benefit, CQ HealthBeat reports.

The rule establishes standards for the electronic transmission of information of the medications covered under the Medicare prescription drug plans of beneficiaries and the availability of generic versions of those treatments. The standards allow physicians and other health care providers, as well as pharmacies and Medicare prescription drug plan sponsors, to share information about medications taken by beneficiaries. In addition, the standards allow pharmacies to inform physicians and other providers when patients obtain their prescriptions. The rule does not require physicians, pharmacies and other providers to adopt e-prescribing to participate in Medicare.

HHS Secretary Mike Leavitt said, "Establishing standards for e-prescribing under Medicare's prescription drug program will help pave the way for widespread adoption of e-prescribing throughout the medical community," adding, "Broader use of e-prescribing offers beneficiaries safer and more efficient care at lower costs."

Supporters hope that the rule will lead to passage of a bill (S 2408) that would require physicians who participate in Medicare to adopt e-prescribing by 2011. Mark Merritt, president and CEO of the Pharmaceutical Care Management Association, said, "The time is now for e-prescribing in Medicare," adding, "Today will be remembered as a major step in the drive for health IT reform" (Carey, CQ HealthBeat, 4/2).

Case Management Providers

Change in Reimbursement Methodology for Case Management

The Department of Health and Human Services, Centers for Medicare and Medicaid Services adopted a rule effective March 3, 2008, that changed the unit of service used in the reimbursement methodology for targeted case management services.

In response to this rule, The Department of Health and Hospitals promulgated an Emergency Rule that was published in eight major daily newspapers in the state and in the May 20, 2008 Louisiana Register (Louisiana Register, Volume 30, Number 5). This rule stipulated the following:

- Effective for dates of service on or after May 1, 2008, case management agencies are required to bill in fifteen-minute increments for services furnished to recipients in the following targeted case management programs: HIV, Nurse Family Partnership, Early and Periodic Screening, Diagnosis and Treatment, Individuals with Developmental Disabilities and Infants and Toddlers.
- Case management agencies shall provide annual costs reports based on the state's fiscal year, starting in the time period beginning July 1, 2008, and ending June 30, 2009. The completed reports are due within 90 calendar days after the end of each fiscal year.

If you have questions regarding the changes in the reimbursement methodology, you may contact the following program offices:

Individuals with Developmental Disabilities Infant and Toddlers case management, the Office for Citizens with Developmental Disabilities	(225) 342-0436
Early Periodic Screening, Diagnosis and Treatment, and Nurse Family Partnership case management, Waiver Assistance and Compliance	(225) 342-6234
HIV case management the Office of Aging and Adult Service	(225) 342-0223

RA Corner

Professional Services

2007 Reimbursement Rate Changes

Based on funding appropriated in the 2007 legislative session and approval by CMS, DHH is pleased to announce reimbursement rate changes for selected physician services. Effective for dates of service on or after October 15, 2007, the reimbursement for selected physician services shall be 90% of the 2007 Louisiana Medicare Region 99 allowable or billed charges, whichever is the lesser amount. The reimbursement shall remain the same for those services that are currently being reimbursed at a rate that is between 90% and 120% of the 2007 Louisiana Medicare Region 99 allowable. For services that are currently reimbursed at a rate above 120% of the 2007 Louisiana Medicare Region 99 allowable, the reimbursement for these services has been reduced to 120% of the 2007 Louisiana Medicare Region 99 allowable. Providers should have noticed a rate change beginning with March 18, 2008 remittance advice. Not all codes were impacted by this process.

RA Corner (continued)

However, there are selected physician services that are still being assessed for inclusion in the reimbursement rate change. Providers will be notified when additional codes are added to these rate changes

The professional services fee schedules that reflect rates before and after the changes can be found on the 'fee schedules' page of the LA Medicaid web site, www.lamedicaid.com, link, 'Fee Schedules.' The 'Professional Services, Lab, X-Ray and ASC Reimbursement/Fee Schedule,' which is effective through date of service October 14, 2007, displays the rates prior to the changes. The schedule effective for dates of service on and after October 15, 2007 contains the updated rate.

On the home page of the Louisiana Medicaid website, there is also a link for a "supplement to the Professional Services fee schedules". This supplement provides a list of the procedure codes currently included in the Medicaid reimbursement change effective on or after date of service October 15, 2007.

Claims paid at the previous rates will be systematically recycled. Providers will be notified when and how the recycle will occur.

Please monitor future RA messages and the Louisiana Medicaid website, which will inform providers of any additional updates.

Professional Services Providers

Prenatal Visits: 2007 Reimbursement Changes and Adjustments

In the RA messages that ran on May 6, 2008, and May 13, 2008, it was indicated that the prenatal services (visits modified with TH) impacted by the rate change effective for dates of service on or after October 15, 2007, were being systematically adjusted with a recycle to appear on the RA of May 13, 2008. However, all of the claims in the adjustment were inadvertently denied for Error 799 (No History Record on File for This Adjustment). For this reason, the adjustment of these claims will now appear on the RA of May 20, 2008. No action is required by providers. We regret any inconvenience this may have caused.

As part of the reimbursement changes funded in the 2007 Legislative Session and approved by CMS, effective for dates of service on or after October 15, 2007, the same methodology used in rate changes for the other selected physician services has been applied to prenatal office visits (visits modified with TH). See the RA message of March 18, 2007, for details of the methodology used. The Professional Services Fee Schedule that includes these services can be found on the www.lamedicaid.com website.

KIDMED Clinics and School-Based Health Centers

KIDMED Clinics and School Based Health Centers Have Access to the RS-0-07

We are pleased to announce that all providers of KIDMED services, including KIDMED Clinics and School Based Health Centers, may now access their RS-0-07 reports electronically on the secure side of the LA Medicaid web site, www.lamedicaid.com, link - CommunityCARE and/or KIDMED Roster of Enrollees. These reports are loaded to the web site monthly and remain on the site for 2 months to allow providers to access the current and the previous months' reports. The reports are also downloadable to allow you to save them in your office system if you have a need to maintain more than the most recent 2 months of data. Effective July 1, 2008, hard copy reports will no longer be mailed to you, and requests for reports to be reprinted hard copy will not be honored. Please ensure that you have procedures in place to retrieve these reports as needed.

COMMUNITY-ACQUIRED METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS SKIN AND SKIN STRUCTURE INFECTIONS

**ALEXANDER BRYANT, PHARM.D.
PHARMACY PRACTICE RESIDENT
COLLEGE OF PHARMACY
UNIVERSITY OF LOUISIANA AT MONROE**

**SHAWN MANOR, PHARM.D., BCPS
ASSISTANT PROFESSOR
COLLEGE OF PHARMACY
UNIVERSITY OF LOUISIANA AT MONROE**

BACKGROUND

Previously considered a hospital-acquired infection, methicillin-resistant *Staphylococcus aureus* (MRSA) has emerged as an increasingly prevalent community-acquired infection as well. The current increase in community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA) infections began in the late 1990's. Since that time, it has become what many clinicians have described as an international epidemic and has become the most frequent cause of skin and soft tissue infections presenting to emergency departments in the United States. A recent study published in the *Journal of the American Medical Association* reported that 8987 cases of invasive MRSA were observed from July 2004 to December 2005 at sites in nine U.S. cities. Of these cases, 2389 (26.6%) were classified as community-onset and 1234 (13.7%) were considered community-associated infections. Healthcare associated, community-onset cases were defined as patients who presented with at least one of the following health care risk factors: invasive device at time of admission, history of MRSA infection/colonization, or a history of surgery, dialysis, hospitalization, or residence in a long-term care facility in the previous 12 months. Community-associated infections were defined as cases with no documented health care risk factor(s). The incidence of cellulitis related to community-associated strains in this study represented 278 (22.7%) of the documented invasive cases, with bacteremia accounting for 798 (65.1%). Other infections attributed to CA-MRSA reported in the study included pneumonia, osteomyelitis, endocarditis, and septic shock. The authors noted that noninvasive infections with MRSA greatly outnumber invasive infections in the community setting. It is also important to note that appropriate treatment is necessary to prevent a non-invasive infection from progressing to an invasive infection. This article will focus on the diagnosis, treatment, and prevention of CA-MRSA skin and skin structure infections.

Louisiana Drug Utilization Review Education (Cont.)

CLINICAL PRESENTATION

CA-MRSA presents as a skin or skin structure infection in 80-90% of reported cases. As described by the CDC, the infection will frequently present as a boil or abscess and patients frequently complain of having a "spider bite." The site involved may be red, swollen, painful, and have pus or other drainage. CA-MRSA infections may also present as impetigo, folliculitis, or paronychia.

RISK FACTORS

Risk factors that have been identified in case reports and epidemiology studies include: correctional facility residence, military personnel, intravenous drug users, tattoo recipients, patients with previous antibiotic use, children, newborns, individuals who live in crowded conditions, homosexual men, HIV-infected patients, homeless individuals, previous CA-MRSA infection, physical contact with a person who is a carrier or has an active infection, health care workers, and athletes. However, considering that CA-MRSA has now reached epidemic proportions, infection with CA-MRSA is not limited to any specific risk factor(s) or population(s).

DIAGNOSIS

Community-associated strains of MRSA can be distinguished from their hospital-associated counterparts by their distinct molecular differences. The most common strain of CA-MRSA is the USA300 clone. This clone has been associated with both sporadic cases and outbreaks of infection and accounts for 50% of all *S. aureus* infections. CA-MRSA strains also produce exotoxins such as Panton-Valentine leukocidin (PVL) which are lethal to neutrophils and cause necrosis of skin. In order to diagnose a suspected community-associated MRSA skin infection, a small biopsy of skin or drainage from the infected site should be collected for culture. It is especially important to obtain a culture in cases of recurrent or persistent infection, and/or in patients with advanced or aggressive infections.

TREATMENT

The choice of empiric systemic antibiotic therapy for uncomplicated skin and soft tissue infections should take into consideration the patient's history and presentation, the suspected pathogens based on the prevalence of common causative bacteria, and the susceptibility patterns of these bacteria in the region. After these aspects are considered, it is important to consider patient-specific factors such as cost, tolerability, and the likelihood of adherence to the treatment regimen. Selection of an antibacterial agent that gives adequate coverage of CA-MRSA is required if first-line oral agents such as cephalexin, dicloxacillin, or amoxicillin/clavulanic acid are chosen for a skin infection and progression of the infection is observed. The duration of treatment for skin and soft tissue infections caused by CA-MRSA is 7-14 days and should be based on the patient's clinical response.

Louisiana Drug Utilization Review Education (Cont.)

ORAL ANTIMICROBIAL OPTIONS FOR THE TREATMENT OF CA-MRSA

Agent	Adult dose	Pediatric dose
Sulfamethoxazole-Trimethoprim (SMX-TMP)	2 double-strength (800/160) tablets every 12 hours	>2 months: 8-12 mg TMP/kg/day divided every 12 hours
Doxycycline	100 mg every 12 hours	≥ 8 years: 2-5 mg/kg/day divided every 12-24 hours (max 200mg/day)
Clindamycin	300-450 mg every 6-8 hours	30 mg/kg/day in 3-4 divided doses
Linezolid	600 mg every 12 hours	>1 week and < 5 years: 10 mg/kg every 8 hours 5-11 years: 10 mg/kg every 12 hours 12-18 years: 600 mg every 12 hours

Surgical intervention (incision and drainage) is also an integral part of therapy in the presence of an abscess. Drainage of the abscess allows for removal of the causative organism and allows an opportunity for bacterial culture. Antibiotic choices should be changed as necessary according to subsequent culture, sensitivities, and/or clinical response. If a patient is unable to take oral medications or the infection progresses and warrants hospitalization, intravenous therapy is required.

INTRAVENOUS ANTIMICROBIAL OPTIONS FOR THE TREATMENT OF CA-MRSA

Agent	Adult dose	Pediatric dose
Clindamycin	600 mg every 8 hours	< 1 month: 10-20 mg/kg/day in divided doses every 6-8 hours > 1 month: 20-40 mg/kg/day in divided doses every 6-8 hours
Vancomycin	15 mg/kg/dose every 12 hours	>1 month: 40-60 mg/kg/day in divided doses every 6-8 hours
Linezolid	600 mg every 12 hours	>1 week and ≤ 11 years: 10 mg/kg every 8 hours ≥ 12 years: 600 mg every 12 hours
Daptomycin	4 mg/kg/dose every 24 hours	Not available - clinical trials currently evaluating use in children
Tigecycline	100 mg once then 50 mg every 12 hours	Not available

Sulfamethoxazole-Trimethoprim (SMX-TMP) - SMX-TMP is frequently used to treat CA-MRSA; however, there are no well designed clinical trials available to show its superiority over other treatment options. In vitro data from a recent study showed that SMX-TMP exhibited greater bactericidal activity against MRSA than did linezolid, rifampicin, clindamycin, or minocycline. There are also case reports and cohort trials showing treatment success with SMX-TMP in patients with CA-MRSA infections. Some common adverse effects associated with SMX-TMP are rash, hyperkalemia, diarrhea, nausea, and vomiting. Less frequent adverse effects that have been associated with SMX-TMP include agranulocytosis, aplastic anemia, hepatic necrosis, and Stevens-Johnson syndrome. The dose of SMX-TMP should be decreased by half in patients with CrCl 15-30 ml/min and should not be used in patients with CrCl < 15 ml/min. SMX-TMP is a pregnancy category class C.

Louisiana Drug Utilization Review Education (Cont.)

Doxycycline - Doxycycline is a broad spectrum bacteriostatic antibiotic that inhibits bacterial protein synthesis. Common adverse effects associated with doxycycline include photosensitivity, gastrointestinal disturbances, and increases in BUN. No dosage adjustments are necessary for patients with renal or hepatic impairment. Doxycycline is a pregnancy category class D.

Clindamycin - No randomized, prospective controlled clinical trials have examined the use of clindamycin in patients with CA-MRSA infection. However, information from case reports has shown that clindamycin is effective when isolates are shown to be susceptible. Clindamycin resistance varies widely by geographic region so it is imperative to recognize local resistance patterns. If an isolate shows resistance to erythromycin and susceptibility to clindamycin, the isolate has an increased likelihood of developing resistance to clindamycin during therapy. For this reason, it is important to have a D test performed on the isolate which can detect the presence of inducible resistance. If the D test returns positive, an antibiotic (other than clindamycin) that shows susceptibility to the isolate should be chosen. Common adverse effects of clindamycin include diarrhea, abdominal pain, nausea, and vomiting. No dosing adjustments are necessary in patients with renal impairment; however, doses should be adjusted in patients with severe hepatic disease. Clindamycin is a pregnancy category class B.

Vancomycin - Vancomycin is a bactericidal glycopeptide antibiotic that inhibits bacterial cell wall synthesis. Common adverse effects of vancomycin include nausea and vomiting, as well as an erythematous rash on the face or upper body ("red man's syndrome" - can be avoided by extending infusion time). When used in combination with nephrotoxic medications or in patients with renal impairment, vancomycin may potentiate renal dysfunction. In patients with CrCl 20-49 ml/min the dose should be reduced to 15-20 mg/kg every 24 hours. For patients with CrCl < 20 ml/min the dose should be based on the resultant vancomycin levels. No dosing changes are necessary for patients with hepatic disease. Vancomycin is a pregnancy category class C.

Linezolid - Linezolid is a novel oxazolidinone antibiotic that binds to a site on the 23S ribosomal RNA of the 50S subunit preventing the formation of the 70S initiation complex resulting in inhibition of protein synthesis. Common adverse effects of linezolid include diarrhea, nausea, and headache. The use of linezolid for greater than two weeks has been associated with significant adverse effects including myelosuppression, peripheral neuropathies, and with extended therapy (≥ 3 months) disorder of the optic nerve may occur. Linezolid also acts as a weak inhibitor of monoamine oxidase (MAO) and may increase the risk of seizures and serotonin toxicity when taken concomitantly with serotonergic medications. There is no dose adjustment necessary for patients with renal impairment or mild to moderate hepatic impairment. Linezolid is a pregnancy category class C.

Daptomycin - Daptomycin is a novel cyclic lipopeptide antibiotic that is rapidly bactericidal in vitro against most clinically relevant gram-positive bacteria. Daptomycin binds to the bacterial membrane causing rapid depolarization of membrane potential which interrupts protein synthesis and results in cell death. Increases in creatinine kinase have been seen with the use of daptomycin. This finding may or may not be associated with muscle weakness and pain. If a patient has complaints of muscle weakness or pain, or the CK is > 10x the upper limit of normal (100 IU/L), the antibiotic choice should be reassessed. In patients with a CrCl < 30 ml/min, the dose of daptomycin should be decreased to 4 mg/kg every 48 hours. No dosing adjustments are required in patients with mild to moderate liver impairment. Daptomycin is a pregnancy category class B.

Louisiana Drug Utilization Review Education (Cont.)

Tigecycline - Tigecycline is a bacteriostatic glycycline antibiotic that inhibits protein translation in bacteria by binding to the 30S ribosomal subunit, preventing incorporation of amino acid residues into elongating peptide chains. Tigecycline has been associated with significant nausea, vomiting, and diarrhea. Acute pancreatitis is a rare but serious adverse effect of tigecycline. There are no dosing adjustments necessary for patients with renal dysfunction. In patients with severe hepatic impairment the loading dose remains 100 mg and the maintenance dose should be decreased to 25 mg every 12 hours. Tigecycline is a pregnancy category class D.

Antibacterial agents currently under investigation that have shown in vitro activity against MRSA include: dalbavancin, telavancin, oritavancin, iclaprim, ceftobiprole and ceftaroline.

PREVENTION

The CDC has developed a model to describe the transmission of CA-MRSA called the "Five C's of CA-MRSA Transmission:"

1. Contact
2. Lack of Cleanliness
3. Compromised skin integrity
4. Contaminated objects, surfaces, and items, and
5. Crowded living conditions

Some preventative actions that could decrease the spread of CA-MRSA include: improved personal hygiene, hand washing, isolation of infected patients (wounds), cleaning athletic equipment (weight benches) after each use, and refraining from sharing personal items such as razors, clothing, and sports equipment. Also, patients being treated for CA-MRSA should be instructed to disinfect commonly touched surfaces in their homes. In the hospital setting, MRSA has been isolated from stethoscopes, pagers, workstations, and physicians' neckties. There are also studies taking place to evaluate the utility of vaccinations against *S. aureus* which may also play a role in the future prevention CA-MRSA.

SUMMARY

CA-MRSA is an international epidemic. It presents most frequently as a skin or skin structure infection and may be associated with redness, swelling, pain, and drainage at the site. Although many risk factors for CA-MRSA infections have been noted in the past, there are many patients who present with CA-MRSA who do not have these risk factors. Diagnosis of CA-MRSA is based on the clinical presentation and cultures of the organism. The differentiation of CA-MRSA from its hospital-acquired counterpart is based on molecular differences and the presence of specific virulence factors present in the CA strains. Treatment of CA-MRSA consists of surgical drainage and sterilization of the site if an abscess is present as well as systemic antibiotics that have shown susceptibility to CA-MRSA in the geographic region. If an initial empiric antibiotic fails to control the infection, cultures should be collected and checked for susceptibilities to specific antibiotics, and therapy should be changed as directed by the results. If CA-MRSA skin infections are untreated or treated inappropriately the infection can progress to invasive infections such as osteomyelitis, bacteremia, pneumonia, or endocarditis. CA-MRSA skin infections are spread by direct contact with a surface (skin-to-skin or inanimate objects contaminated with CA-MRSA). Taking actions such as hand-washing, cleaning sports equipment after use, not sharing personal items, and education of patients can help decrease the spread of CA-MRSA.

