

REMICADE-maintenance experienced elevations in ALT at >1 to <3 times the ULN compared to 34% of patients treated with placebo-maintenance. ALT elevations  $\geq 3$  times the ULN were observed in 5% of patients who received REMICADE-maintenance compared with 4% of patients who received placebo-maintenance. ALT elevations  $\geq 5$  times ULN were observed in 2% of patients who received REMICADE-maintenance compared to none in patients treated with placebo-maintenance. In UC clinical trials (median follow up 30 weeks. Specifically, the median duration of follow-up was 30 weeks for placebo and 31 weeks for REMICADE.), 17% of patients receiving REMICADE experienced elevations in ALT at >1 to <3 times the ULN compared to 12% of patients treated with placebo. ALT elevations  $\geq 3$  times the ULN were observed in 2% of patients who received REMICADE compared with 1% of patients who received placebo. ALT elevations  $\geq 5$  times ULN were observed in <1% of patients in both REMICADE and placebo groups. In an AS clinical trial (median follow up 24 weeks for placebo group and 102 weeks for REMICADE group) 51% of patients receiving REMICADE experienced elevations in ALT at >1 to <3 times the ULN compared to 15% of patients treated with placebo. ALT elevations  $\geq 3$  times the ULN were observed in 10% of patients who received REMICADE compared to none in patients who received placebo. ALT elevations  $\geq 5$  times ULN were observed in 4% of patients who received REMICADE compared to none in patients treated with placebo. In a PsA clinical trial (median follow up 39 weeks for REMICADE group and 18 weeks in placebo group) 50% of patients receiving REMICADE experienced elevations in ALT at >1 to <3 times the ULN compared to 16% of patients treated with placebo. ALT elevations  $\geq 3$  times the ULN were observed in 7% of patients who received REMICADE compared to none in patients who received placebo. ALT elevations  $\geq 5$  times ULN were observed in 2% of patients who received REMICADE compared to none in patients treated with placebo. In PsO clinical trials, (ALT values are obtained in 2 phase 3 psoriasis studies with median follow-up of 50 weeks for REMICADE and 16 weeks for placebo), 49% of patients receiving REMICADE experienced elevations in ALT at >1 to <3 times the ULN compared to 24% of patients treated with placebo. ALT  $\geq 3$  x ULN were observed in 8% of patients who received REMICADE compared to <1% who received placebo. ALT elevations  $\geq 5$  x ULN were observed in 3% of patients who received REMICADE compared to none in patients treated with placebo. **Adverse Reactions in Pediatric Crohn's Disease** There were some differences observed in the adverse reactions observed in the pediatric patients receiving REMICADE compared to those observed in adults with CD. The following adverse events were reported more commonly in 103 randomized pediatric CD patients administered 5 mg/kg REMICADE through 54 weeks than in 385 adult CD patients receiving a similar treatment regimen: anemia (11%), blood in stool (10%), leukopenia (9%), flushing (9%), viral infection (8%), neutropenia (7%), bone fracture (7%), bacterial infection (6%), and respiratory tract allergic reaction (6%). Infections were reported in 56% of randomized pediatric patients in Study Peds Crohn's and in 50% of adult patients in Study Crohn's I. In Study Peds Crohn's, infections were reported more frequently for patients who received every 8 week as opposed to every 12 week infusions (74% and 38%, respectively), while serious infections were reported for 3 patients in the every 8 week and 4 patients in the every 12 week maintenance treatment group. The most commonly reported infections were upper respiratory tract infection and pharyngitis, and the most commonly reported serious infection was abscess. Pneumonia was reported for 3 patients. (2 in the every 8 week and 1 in the every 12 week maintenance treatment groups). Herpes zoster was reported for 2 patients in the every 8 week maintenance treatment group. In Study Peds Crohn's, 18% of randomized patients experienced one or more infusion reactions, with no notable difference between treatment groups. Of the 112 patients in Study Peds Crohn's, there were no serious infusion reactions, and 2 patients had non-serious anaphylactoid reactions. Antibodies to REMICADE developed in 3% of pediatric patients in Study Peds Crohn's. Elevations of ALT up to 3 times the upper limit of normal (ULN) were seen in 18% of pediatric patients in CD clinical trials; 4% had ALT elevations  $\geq 3$  x ULN, and 1% had elevations  $\geq 5$  x ULN. (Median follow-up was 53 weeks.) The most common serious adverse events reported in the post-marketing experience in children were infections (some fatal) including opportunistic infections and tuberculosis, infusion reactions, and hypersensitivity reactions. Serious adverse events in the post-marketing experience with REMICADE in the pediatric population have also included malignancies, including hepatosplenic T-cell lymphomas (see *Boxed WARNINGS* and *WARNINGS*), transient hepatic enzyme abnormalities, lupus-like syndromes, and the development of autoantibodies. **Adverse Reactions in Psoriasis Studies** During the placebo-controlled portion across the three clinical trials up to Week 16, the proportion of patients who experienced at least 1 SAE (defined as resulting in death, life threatening, requires hospitalization, or persistent or significant disability/incapacity) was 1.7% in the 3 mg/kg REMICADE group, 3.2% in the placebo group, and 3.9% in the 5 mg/kg REMICADE group. Among patients in the 2 Phase 3 studies, 12.4% of patients receiving REMICADE 5 mg/kg every 8 weeks through one year of maintenance treatment experienced at least 1 SAE in Study I. In Study II, 4.1% and 4.7% of patients receiving REMICADE 3 mg/kg and 5 mg/kg every 8 weeks, respectively, through one year of maintenance treatment experienced at least 1 SAE. One death due to bacterial sepsis occurred 25 days after the second infusion of 5 mg/kg REMICADE. Serious infections included sepsis, and abscesses. In Study I, 2.7% of patients receiving REMICADE 5 mg/kg every 8 weeks through 1 year of maintenance treatment experienced at least 1 serious infection. In Study II, 1.0% and 1.3% of patients receiving REMICADE 3 mg/kg and 5 mg/kg, respectively, through 1 year of treatment experienced at least 1 serious infection. The most common serious infections (requiring hospitalization) were abscesses (skin, throat, and peri-rectal) reported by 5 (0.7%) patients in the 5 mg/kg REMICADE group. Two active cases of tuberculosis were reported: 6 weeks and 34 weeks after starting REMICADE. In placebo-controlled portion of the psoriasis studies, 7 of 1123 patients who received REMICADE at any dose were diagnosed with at least one NMSC compared to 0 of 334 patients who received placebo. In the psoriasis studies, 1% (15/1373) of patients experienced serum sickness or a combination of arthralgia and/or myalgia with fever, and/or rash, usually early in the treatment course. Of these patients, 6 required hospitalization due to fever, severe myalgia, arthralgia, swollen joints, and immobility. **Other Adverse Reactions** Safety data are available from 4779 REMICADE-treated adult patients, including 1304 with RA, 1106 with CD, 484 with UC, 202 with AS, 293 with PsA, 1373 with plaque PsO and 17 with other conditions. (For information on other adverse reactions in pediatric patients, see *ADVERSE REACTIONS, Adverse Reactions in Pediatric Crohn's Disease*.) Adverse events reported in  $\geq 5\%$  of all patients with RA receiving 4 or more infusions are listed below. The types and frequencies of adverse reactions observed were similar in REMICADE-treated RA, AS, PsA, plaque PsO and CD patients except for abdominal pain, which occurred in 26% of REMICADE-treated patients with CD. In the CD studies, there were insufficient numbers and duration of follow-up for patients who never received REMICADE to provide meaningful comparisons. The percentages of adverse events for placebo-treated patients (n=350; average weeks of follow-up 59) and REMICADE-treated patients (n=1129; average weeks of follow-up 66), respectively, are: *Gastrointestinal*: Nausea: 20, 21; Abdominal pain: 8, 12; Diarrhea: 12, 12; Dyspepsia: 7, 10; *Respiratory*: Upper respiratory tract infection: 25, 32; Sinusitis: 8, 14; Pharyngitis: 8, 12; Coughing: 8, 12; Bronchitis: 9, 10; Rhinitis: 5, 8; *Skin and appendages disorders*: Rash: 5, 10; Pruritis: 2, 7; *Body as a whole—general disorders*: Fatigue: 7, 9; Pain: 7, 8; *Resistance mechanism disorders*: Fever: 4, 7; Moniliasis: 3, 5; *Central and peripheral nervous system disorders*: Headache: 14, 18; *Musculoskeletal system disorders*: Back pain: 5, 8; Arthralgia: 7, 8; *Urinary system disorders*: Urinary tract infection: 6, 8; *Cardiovascular disorders, general*: Hypertension: 5, 7. Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in clinical trials of a drug cannot be directly compared to rates in clinical trials of another drug and may not predict the rates observed in broader patient populations in clinical practice. The most common serious adverse events observed in clinical trials were infections (see *ADVERSE REACTIONS, Infections*). Other serious, medically relevant adverse events  $\geq 0.2\%$  or clinically significant adverse events by body system were as follows: *Body as a whole*: allergic reaction, diaphragmatic hernia, edema, surgical/procedural sequelae; *Blood*: pancytopenia; *Cardiovascular*: circulatory failure, hypotension, syncope; *Gastrointestinal*: constipation, gastrointestinal hemorrhage, ileus, intestinal obstruction, intestinal perforation, intestinal stenosis, pancreatitis, peritonitis, proctalgia; *Central & Peripheral Nervous*: meningitis, neuritis, peripheral neuropathy, dizziness; *Heart Rate and Rhythm*: arrhythmia, bradycardia, cardiac arrest, tachycardia; *Liver and Biliary*: biliary pain, cholecystitis, cholelithiasis, hepatitis; *Metabolic and Nutritional*: dehydration; *Musculoskeletal*: intervertebral disk herniation, tendon disorder; *Myo-, Endo-, Pericardial, and Coronary Valve*: myocardial infarction; *Platelet, Bleeding, and Clotting*: thrombocytopenia; *Neoplasms*: basal cell, breast, lymphoma; *Psychiatric*: confusion, suicide attempt; *Red Blood Cell*: anemia, hemolytic anemia; *Reproductive*: menstrual irregularity; *Resistance Mechanism*: cellulitis, sepsis, serum sickness; *Respiratory*: adult respiratory distress syndrome, lower respiratory tract infection (including pneumonia), pleural effusion, pleurisy, pulmonary edema, respiratory insufficiency; *Skin and Appendages*: increased sweating, ulceration; *Urinary*: renal calculus, renal failure; *Vascular (Extracardiac)*: brain infarction, pulmonary embolism, thrombophlebitis; *White Cell and Reticuloendothelial*: leukopenia, lymphadenopathy. **Post-marketing Adverse Events** The following adverse events, some with fatal outcome, have been reported during post-approval use of REMICADE: neutropenia (see *WARNINGS, Hematologic Events*), interstitial lung disease (including pulmonary fibrosis/interstitial pneumonitis and very rare rapidly progressive disease), idiopathic thrombocytopenic purpura, thrombotic thrombocytopenic purpura, pericardial effusion, systemic and cutaneous vasculitis, erythema multiforme, Stevens-Johnson Syndrome, toxic epidermal necrolysis, Guillain-Barré syndrome, psoriasis (including new onset and pustular, primarily palmar/plantar), transverse myelitis, and neuropathies (additional neurologic events have also been observed, see *WARNINGS, Neurologic Events*) and acute liver failure, jaundice, hepatitis, and cholestasis (see *WARNINGS, Hepatotoxicity*). Because these events are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to REMICADE exposure. The following serious adverse events have been reported in the post-marketing experience in children: infections (some fatal) including opportunistic infections and tuberculosis, infusion reactions, and hypersensitivity reactions. Serious adverse events in the post-marketing experience with REMICADE in the pediatric population have also included malignancies, including hepatosplenic T-cell lymphomas (see *Boxed WARNINGS* and *WARNINGS*), transient hepatic enzyme abnormalities, lupus-like syndromes, and the development of autoantibodies. **OVERDOSAGE**: Single doses up to 20 mg/kg have been administered without any direct toxic effect. In case of overdosage, it is recommended that the patient be monitored for any signs or symptoms of adverse reactions or effects and appropriate symptomatic treatment instituted immediately. **Administration Instructions Regarding Infusion Reactions** Adverse effects during administration of REMICADE have included flu-like symptoms, headache, dyspnea, hypotension, transient fever, chills, gastrointestinal symptoms, and skin rashes. Anaphylaxis might occur at any time during REMICADE infusion. Approximately 20% of REMICADE-treated patients in all clinical trials experienced an infusion reaction compared with 10% of placebo-treated patients (see *ADVERSE REACTIONS, Infusion-related Reactions*). Prior to infusion with REMICADE, premedication may be administered at the physician's discretion. Premedication could include antihistamines (anti-H1 +/- anti-H2), acetaminophen and/or corticosteroids. During infusion, mild to moderate infusion reactions may improve following slowing or suspension of the infusion, and upon resolution of the reaction, reinitiation at a lower infusion rate and/or therapeutic administration of antihistamines, acetaminophen, and/or corticosteroids. For patients that do not tolerate the infusion following these interventions, REMICADE should be discontinued. During or following infusion, patients that have severe infusion-related hypersensitivity reactions should be discontinued from further REMICADE treatment. The management of severe infusion reactions should be dictated by the signs and symptoms of the reaction. Appropriate personnel and medication should be available to treat anaphylaxis if it occurs.

**REFERENCES**: 1. *Am J Respir Crit Care Med*. 2000;161:S221-S247. 2. See latest Centers for Disease Control guidelines and recommendations for tuberculosis testing in immunocompromised patients. 3. Gardam MA, Keystone EC, Menzies R, et al. Anti-tumor necrosis factor agents and tuberculosis risk: mechanisms of action and clinical management. *Lancet Infect Dis*. 2003;3:148-155. 4. Balhadj K, Reyes F, Farcat JP, et al. Hepatosplenic  $\gamma$ T-cell lymphoma is a rare clinicopathologic entity with poor outcome: report on a series of 21 patients. *Blood*. 2003;102(13):4261-4269.

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# Fracture Risk Assessment To Get Overhaul in 2008

BY BETSY BATES

Los Angeles Bureau

SAN DIEGO — Osteoporosis management is about to undergo some changes, including a new international focus on assessing fracture risk in clinical practice and an emphasis on vitamin D, Dr. Stuart L. Silverman predicted at the Perspectives in Women's Health conference, sponsored by FAMILY PRACTICE NEWS, OB.GYN. NEWS, and INTERNAL MEDICINE NEWS.

"We're changing the whole way we approach osteoporosis in 2008," said Dr. Silverman, with the International Working Group on Fracture Risk Assessment for the World Health Organization.

New guidelines will encourage the calculation of fracture risk based not only on their bone mineral density and T score, but also on age, body mass index, family history, and other factors, he explained.

This composite fracture score, expected to be incorporated into software linked with dual-energy x-ray absorptiometry (DXA) equipment by late 2008, will provide a much more comprehensive and easy-to-understand risk profile, he said.

"You will get a printout that says your patient has, [for example], a 10-year risk of hip fracture of 3%," said Dr. Silverman, of the division of rheumatology at Cedars-Sinai Medical Center in Los Angeles.

The calculated 10-year risk for clinical fracture of the shoulder, forearm, or vertebra will be included in a separate score.

Factors in the 10-year predictions of fracture risk include:

► **Age**, which can change the 10-year risk for a woman with a T score of -2.5 at the femoral neck from 2% at age 50 to 12.5% at age 80.

► **History of prior fragility fracture**, which increases fracture risk fivefold.

► **Low body weight/BMI**.

► **History of a hip fracture in the patient's mother or father**.

► **Lifetime history of ever using corticosteroids** at a dose of 5 mg/day or greater for 3 months or longer.

► **Current smoking**.

► **Consumption of more than two alcoholic drinks per day**.

► **Secondary osteoporosis** caused by a disease process or a drug.

"Your goal is not to reduce risk of osteoporosis, but to reduce the risk of fracture," Dr. Silverman said.

One way that risk can be reduced is through vitamin D supplementation recommendations, which are also likely to change soon, according to Dr. Silverman.

"Recently we've all come to appreciate that we really need much more vitamin D," he said. "We're pushing for 800 to 1,000 IU day, and I will tell you that a lot of us in the field ... are actually taking more than that," he added.

New studies show vitamin D is useful not only for bones, but for balance and for reducing overall cancer risk, he noted.

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# Height Loss Over 3 Years Predicts Osteoporosis in Patients Over 50

BY BETSY BATES

Los Angeles Bureau

VANCOUVER, B.C. — Measuring a patient's height during routine primary care visits may be one of the simplest and least expensive ways to predict osteoporosis risk and to guide screening, according to a study at Virginia Commonwealth University, Richmond.

Height loss of 1.5 inches (about 4 cm) or more over 3 years was associated with almost a doubling of osteoporosis risk in patients aged 50 years or older in the study of 1,039 primary care patients, reported Dr. Emmeline Gasink at the annual meeting of the North American Primary Care Research Group.

Mean height loss in the study population was 0.596 inches, said Dr. Gasink, currently a resident in the family medicine program at Riverside Healthcare System in Carrollton, Va.

Among the 16% of patients who had a height loss of at least 1.5 inches, 3% had a diagnosis of osteoporosis (odds ratio, 1.8) of developing the disease.

Some patients (13%) had significant height loss but were not diagnosed with

osteoporosis. Another 8% did not have significant height loss but had osteoporosis, perhaps representing osteoporosis in a nonvertebral site, said Dr. Gasink in an interview at the meeting.

Nonetheless, a height loss of 1.5 inches or greater over 3 years provided a positive predictive value of 21% for osteoporosis, she said.

The study population was 71% female, so the risk may be slightly less for males. Also, people with low bone density tend to lose height more rapidly than do those with greater bone density.

Still, the overall conclusion of the study, together with findings from five longitudinal trials reviewed by Dr. Gasink, suggest a "strong relationship" between height loss and a new vertebral fracture, lending strength to her findings.

"Height measurement should definitely be a part of a yearly physical for patients 50 and older, as recommended by the U.S. Preventive Health Task Force," noted Dr. Gasink after the meeting. "As a family physician who follows these people over a period of years, [I suggest that] it would be an easy piece of data to help determine early risk factors for osteoporosis." ■