Lower-extremity radiographs: Weight-bearing, please

Injured workers often require imaging for joint-related trauma or pain. After a history and examination, plain radiographs are often the next step in investigating a patient's musculoskeletal complaints. Patients with possible surgical pathology, such as osteoarthritis, may be referred to an orthopaedic surgeon, who often repeats the initial films. While there may be other reasons for requesting new X-rays, such as time elapsed since first films, specific views, or accessibility, a very common reason is that the original films were not ordered weight-bearing.

So why weight-bearing X-rays? For the hip, there are some authors who feel supine radiographs are sufficient,[1] but many consider a weight-bearing AP pelvis film to be standard.[2,3] Although osteophytes can be seen on both, the discussion is on the best evaluation of joint space narrowing (JSN). The Osteoarthritis (OA) Research Society International noted that while standing films have a theoretical advantage of evaluating JSN, they can be assessed accurately supine as well for normal hip morphology. Patients with any hip dysplasia have been shown to be more accurately assessed for OA with standing films.[4]

Standing foot and ankle X-rays are the standard for assessing conditions such as flat foot, ankle arthritis, and hallux valgus as well as other conditions.[5-9] Non-weight-bearing images are often felt to be misleading, while standing films allow better standardization and reliability in assessment between studies and patients.[9] Weight-bearing radiographs are also used to assess patients for subtle ligamentous disruptions, such as Lisfranc injuries not seen on initial films.[10]

The standard radiographic for OA of the knee includes weight-bearing AP, lateral, skyline views.[11] A weight-bearing tunnel (Rosenberg) view may increase detection.[11] Weight-bearing views have been shown to more accurately assess JSN than supine films. They can also better demonstrate malalignment, such as varus or valgus. For patients ⩾ 40 years old with > 50% JSN on weight-bearing films referred with only an MRI, the latter is found not useful in the majority of cases.[12]

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All this highlights some of the importance of obtaining weight-bearing X-rays. But the issue is hardly limited to Canada. A 2012 British study found no patients with knee issues referred from a GP's office to an orthopaedic clinic had had weight-bearing films. Another 2014 British study found 98% of nontraumatic knee radiographs requested by GPs were non-weight-bearing.[13] The former recommended all requests to the Radiology Department for knee radiographs from GPs to be standardized as weight-bearing while the latter advised GPs to order them as weight-bearing.

In the end, requesting weight-bearing radiographs for elective assessment of the lower extremity is obvious. The only question that remains is, is it *weightbearing*, *weight-bearing*, or *weight bearing*? Maybe just write "WB" or "standing," and avoid the conundrum.

—Derek Smith, MD, FRCSC
WorkSafeBC Orthopaedic Specialist Advisor

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References

1. Phillipon MJ, Briggs KK, Goljan P, et al. Comparison of radiographic hip joint space in weight bearing and supine X-rays in patients with hip pathology. Osteoarthritis Cartilage 2013;21:S204.
2. Courtney PM, Melnic CM, Howard M, et al. A systematic approach to evaluating hip radiographs – A focus on osteoarthritis. J Orthopedics Rheumatol 2014;1:1-7.
3. Fuchs-Winkelmann S, Peterlein CD, Tibesku CO, Weinstein SL. Comparison of pelvic radiographs in weightbearing and supine positions. Clin Orthop Relat Res 2008;466:809-812.
4. Gold GE, Cicuttini F, Crema MD, et al. OARSI clinical trials recommendations: Hip imaging in clinical trials in osteoarthritis. Osteoarthritis and Cartilage 2015; 23:716-731.
5. Younger AS, Sawatzky B, Dryden P, et al. Radiographic assessment of adult flatfoot. Foot Ankle Int 2005;26:820-825.
6. Lever CJ, Hennessy MS. Adult flat foot deformity. Orthopaedics Trauma 2016; 30:41-50.
7. Hayes BJ, Gonzales T, Smith JT, et al. Ankle arthritis: You can't always replace it. J Am Acad Orthop Surg 2016;24:e29-e38.
8. Wagner P, Wagner E. Is the rotational deformity important in our decision-making process for correction of Hallux Valgus Deformity? Foot Ankle Clin 2018;23: 205-217.
9. Barg A, Pagenstert GI, Hugle T, et al. Ankle osteoarthritis etiology, diagnostics, and classification. Foot Ankle Clin 2013;18: 411-426.
10. Weatherford BM, Anderson JG, Bohay

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July 2018. http://policybase.cma.ca/dbtw-wpd/Policypdf/PD15-12.pdf.
2. Statistics Canada. Canadian health characteristics, annual estimates. Table 13-10-0096-01. Accessed 31 July 2018. www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310009601.
3. Government of British Columbia. Active people, active places: British Columbia physical activity strategy. November 2015. Accessed 31 July 2018. www.health.gov.bc.ca/library/publications/year/2015/active-people-active-places-web-2015.pdf.
4. Coleman KJ, Ngor E, Reynolds K, et al. Initial validation of an exercise "vital sign" in electronic medical records. Med Sci Sports Exerc 2012;44:2071-2076.
5. Grant, RW, Schmittdiel, JA, Neugebauer, RS, et al. Exercise as a vital sign: A quasi-experimental analysis of a health system intervention to collect patient-reported exercise levels. J Gen Intern Med 2014; 29:341-348.
6. Thornton JS, Frémont P, Khan K, et al. Physical activity prescription: A critical opportunity to address a modifiable risk factor for the prevention and management of chronic disease: A position statement by the Canadian Academy of Sport and Exercise Medicine. Br J Sports Med 2016; 50:1109-1114.

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DR. Management of tarsometatarsal joint injuries. J An Acad Orthop Surg 2017; 25:469-479.
11. Wright RW, MARS Group. Osteoarthritis classification scales: Interobserver reliability and arthroscopic correlation. J Bone Joint Surg Am 2014;96:1145-1151.
12. Adelani MA, Mall NA, Brophy RH, et al. The use of MRI in evaluating knee pain in patients aged 40 years and older. J Am Acad Orthop Surg 2016;24:653-659.
13. Chen A, Balogun-Lynch J, Aggarwal K, et al. Should all elective knee radiographs requested by general practitioners be performed weight-bearing? SpringerPlus 2014;3:707.

Directory of senior staff

doctors of bc

Mr Allan Seckel
Chief Executive Officer
604 638-2888;
aseckel@doctorsofbc.ca

Ms Marisa Adair
Executive Director of Communications and Public Affairs; 604 638-2809;
madair@doctorsofbc.ca

Mr Jim Aikman
Executive Director of Economics and Policy Analysis; 604 638-2893
jaikman@doctorsofbc.ca

Dr Sam Bugis
Executive Director of Physician and External Affairs
604 638-8750;
sbugis@doctorsofbc.ca

Dr Andrew Clarke
Executive Director,
Physician Health Program
604 398-4301;
andrew@physicianhealth.com

Ms Amanda Corcoran
Chief People & Technology Officer
604 638-2812;
acorcoran@doctorsofbc.ca

Ms Cathy Cordell
General Counsel
604 638-2822;
ccordell@doctorsofbc.ca

Ms Margaret English
Director, Shared Care Committee
604 638-2947;
menglish@doctorsofbc.ca

Ms Alana Godin
Director, Community Practice and Quality
250 218-3924;
agodin@doctorsofbc.ca

Dr Brenda Hefford
Executive Director, Community Practice, Quality, and Integration
604 638-7855;
bhefford@doctorsofbc.ca

Mr Rob Hulyk
Director of Physician Advocacy
604 638-2883;
rhulyk@doctorsofbc.ca

Mr Sunny Jassal
Network Operations Manager
604 638-2897;
sjassal@doctorsofbc.ca

Mr Adrian Leung
Director, Specialist Services Committee
604 638-2884;
aleung@doctorsofbc.ca

Ms Sinden Luciuk
Executive Director of Members' Products and Services
604 638-2886;
sluciuk@doctorsofbc.ca

Mr Tod MacPherson
Director of Negotiations
604 638-2885;
tmacpherson@doctorsofbc.ca

Ms Afsaneh Moradi
Director, Community Partnership & Integration
604 638-5845;
amoradi@doctorsofbc.ca

Ms Cindy Myles
Director, Facility Physician Engagement
604 638-2834;
cmyles@doctorsofbc.ca

Ms Carol Rimmer
Director, Technology and Operations, Doctors Technology Office
604 638-5775;
crimmer@doctorsofbc.ca

Mr Paul Straszak
Executive Director of Negotiations and Chief Negotiator
604 638-2869;
pstraszak@doctorsofbc.ca

Ms Sarah Vergis
Chief Financial Officer
604 638-2862;
svergis@doctorsofbc.ca

Ms Deborah Viccars
Director of Policy
604 638-7865;
dviccars@doctorsofbc.ca