Clinical examination essentials pdf full length

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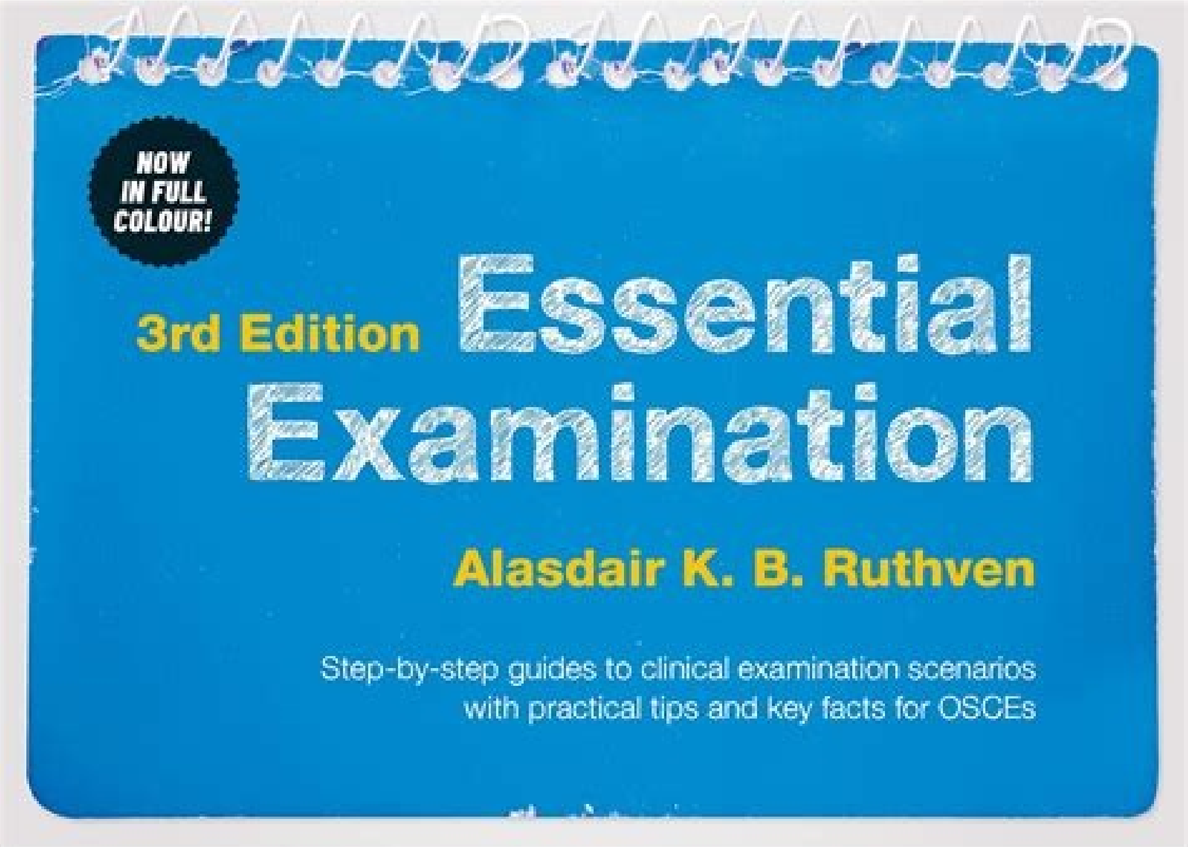

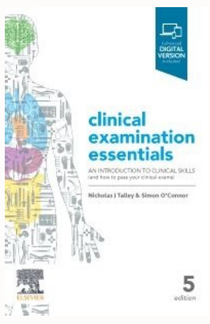

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Leg Length Discrepancy Assessment: Accuracy and Precision in Five Clinical Methods of Evaluation*

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Five clinical methods of leg length discrepancy assessment were tested against one another for their relative accuracy and precision compared to exact anatomical standards as determined by radiograph. Five normal subjects, one with a known discrepancy of 1.3 cm, were evaluated by twenty physical therapists each using every method of assessment. T-tests and F-tests ($\alpha = 0.05$) were used to determine statistical accuracy and precision among methods. Absolute values of mean differences, standard deviations, and ranges were used to determine clinical significance. The indirect method, which employed lift blocks under a foot with a subject in the standing position, proved to be the most accurate and precise method of any tested. Of the direct methods tested, which employ a tape measure between various anatomical landmarks, the technique shown to be the most accurate and precise utilized the landmarks of the anterior superior iliac spine and the lateral malleolus of the fibula.

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In many cases, the decision to implement treatment or to subject a patient to more sophisticated forms of testing (some with significant risk) is made on the basis of a clinical measurement or observation. The accuracy and precision of clinical measurements is, thus, not without consequence if performed improperly or if significant margins of error exist in a given procedure. A frequently performed clinical test in the evaluation of certain musculoskeletal disorders is that of leg length discrepancy (LLD) assessment.

Leg length discrepancies are usually classified into two groups: true and functional. True LLD are those in which an actual bony asymmetry exists somewhere between the head of the femur and the mortise of the ankle.[5,7,14,22,24] Functional LLD are those which occur as a physiological response to altered mechanics along the kinetic chain anywhere from the foot to the lumbar spine giving the appearance of a short leg when a bony asymmetry in the length of bones might not actually exist.[2,6,15,16,21,26] Regardless of whether the LLD is true or functional, the mechanical effects on the kinetic chain are potentially the same for either. The incidence of LLD in the normal adult population may be as high as 60 to 70%.[25]

Minor LLD is described by Redler[22] as that LLD being of such magnitude as to be unrecognized until looked for and when found becomes obvious. The significance of such minor LLD in pathology is, however, controversial.[6,21] Some authors believe that an LLD of 5 millimeters or less has definite significance in mechanically related dysfunctions around the hips, pelvis, and spine.[2,4,6,11,13,16,17,20,23,25] Other investigators believe that LLD less than ½ inch (12.7 millimeters) is not significant and has no pathological implications.[7,24,26] The work of Pauwels, however, has demonstrated that LLD of one-half inch can change the angle of Wiberg of the hip on the side of the LLD by as much as 2.3°.[4] This change is enough to upset the normal joint mechanics and eventually lead to degenerative osteoarthrosis of that hip. Yet, others state that LLD need not be

* This study was completed in partial fulfillment of the requirements for MAJ Woerman's degree of Master of Medical Science in Physical Therapy, Division of Allied Health Professions, Emory University School of Medicine, Atlanta, GA. The opinions expressed herein are solely those of the authors and are not to be construed as official or as reflecting the view of the Army Medical Department, the Department of the Army, or the Department of Defense.
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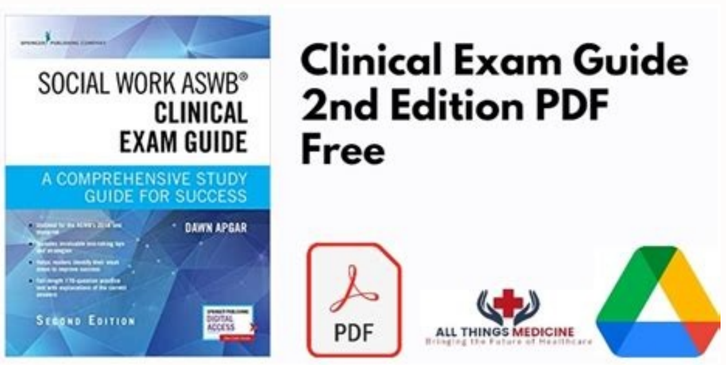

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