Audit of Access to DEXA Scanning and Quality of DEXA Reporting in Patients at Risk of Osteoporosis

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ABSTRACT

Objective: To evaluate adherence to osteoporosis screening recommendations by assessing dual- energy X-ray absorptiometry (DEXA) referral practices and the quality of DEXA reporting among patients attending a specialized endocrine outpatient clinic.

Methodology: A retrospective clinical audit was conducted in a specialized diabetes, endocrine, and weight management outpatient clinic between November 1 and December 31, 2025. Medical records of patients attending the clinic during the audit period were reviewed. Patients meeting the National Institute for Health and Care Excellence (NICE) guideline NG56 criteria for DEXA referral were identified. Data were collected regarding referral practices, DEXA completion rates, and quality of DEXA report documentation. Compliance with predefined audit standards was assessed using descriptive statistics.

Results: A total of 227 patients were reviewed, of whom 56 (24.7%) met NICE criteria for DEXA referral. Only 28 (50.0%) eligible patients were advised to undergo DEXA scanning, which was substantially below the target standard of ≥90%. Among those advised, 17 (60.7%) completed the scan, failing to meet the predefined target of ≥80%. Assessment of completed DEXA reports demonstrated poor documentation quality. DEXA indication was documented in none of the reports (0%), formal interpretation in 4 (23.5%), FRAX assessment in 8 (47.1%), management plans in 14 (82.4%), and referring clinician details in 15 (88.2%). Among completed scans, 11.8% were normal, 64.7% showed osteopenia, and 23.5% demonstrated osteoporosis.

Conclusion: Significant deficiencies were identified in both DEXA referral practices and DEXA report documentation. Implementation of standardized referral pathways, reporting templates, and clinician education initiatives may improve adherence to osteoporosis assessment guidelines and facilitate timely identification and management of patients at risk of fragility fractures.

KEYWORDS: Osteoporosis; Dual-energy X-ray absorptiometry; DEXA; Bone mineral density; FRAX; Clinical audit.

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INTRODUCTION

Osteoporosis is a major public health concern characterized by reduced bone strength and increased susceptibility to fragility fractures. Globally, osteoporosis contributes substantially to morbidity, mortality, healthcare utilization, and economic burden, particularly among older adults and individuals with chronic medical conditions.[1] Early identification of individuals at increased risk of fracture is essential for timely intervention and prevention of adverse skeletal outcomes.[2]

Dual-energy X-ray absorptiometry (DEXA) remains the gold standard for the assessment of bone mineral density (BMD) and plays a central role in the diagnosis and management of osteoporosis.[3] International guidelines recommend DEXA scanning in individuals with established risk factors, including advanced age, previous fragility fractures, prolonged corticosteroid exposure, and medical conditions associated with secondary osteoporosis.[4]

The National Institute for Health and Care Excellence (NICE) guideline NG56 provides evidence-based recommendations for fracture risk assessment and osteoporosis management.[5] Appropriate referral for DEXA scanning and comprehensive reporting of scan findings are essential components of effective osteoporosis care. Inadequate referral practices may result in missed diagnoses, while poor-quality reporting may compromise clinical decision-making and fracture prevention strategies.[6]

Despite the recognized importance of osteoporosis screening, data regarding adherence to DEXA referral recommendations and reporting standards in specialized endocrine outpatient settings remain limited. This audit was conducted to evaluate adherence to NICE NG56 recommendations regarding DEXA referral and to assess the quality of DEXA report documentation in a specialized endocrine outpatient clinic.

METHODOLOGY

This retrospective clinical audit was conducted in Prime Health Hub–DEW, Lahore, Pakistan, a specialized outpatient clinic for diabetes, endocrine, and weight management. The audit included patients who attended the clinic between November 1, 2025, and December 31, 2025.

Audit Standards: In the absence of a national guideline for osteoporosis assessment in Pakistan, NICE Guideline NG56 was adopted as the audit standard. This guideline was considered appropriate because it is widely recognized internationally, provides clear criteria for identifying individuals at risk, and aligns with best practices in fracture prevention and bone health management.

The predefined audit targets were:

- Eligible patients advised to undergo DEXA scanning: ≥90%
- DEXA completion among advised patients: ≥80%
- Documentation of DEXA indication: 100%
- Documentation of formal interpretation: 100%
- FRAX documentation where indicated: ≥90%
- Documentation of management plan: ≥90%
- Documentation of referring clinician details: 100%

Inclusion Criteria:

Patients meeting one or more NICE NG56 criteria for DEXA referral were included:

- Women aged ≥65 years
- Men aged ≥75 years
- Postmenopausal women and men aged ≥50 years with clinical risk factors
- History of fragility fracture
- Long-term systemic corticosteroid therapy
- Medical conditions associated with secondary osteoporosis
- Lifestyle risk factors associated with osteoporosis

Table-I: Comparison of observed clinical practice against the NG56 criteria.

Audit Criterion	*NICE Standard*	*Compliance Rate (n/N)*	*Observed Compliance*	*Status*
Eligible patients advised for DEXA consideration	≥90%	28/56	50.0%	Not Met
DEXA completed when advised Indication documented in the report	≥80%	17/28	60.7%	Not Met
Formal interpretation documented FRAX documented where indicated Management plan documented Referring clinician documented	100%	0/17	0.0%	Not Met
	100%	4/17	23.5%	Not Met
	≥90%	8/17	47.1%	Not Met
	≥90%	14/17	82.4%	Partially Met
	100%	15/17	88.2%	Partially Met

None of the evaluated criteria achieved full compliance with predefined audit standards.

- Intermediate fracture risk requiring bone mineral density assessment

Exclusion Criteria:

- Repeat clinic visits during the audit period were excluded to avoid duplication of patient records.

Data were collected from electronic consultation records, patient medical files, and available DEXA reports. Information extracted included patient eligibility for DEXA referral, documentation of DEXA recommendations, DEXA completion status, and quality indicators within completed DEXA reports.

The following reporting components were assessed:

- Documentation of indication for DEXA
- Formal interpretation of results
- FRAX calculation where appropriate
- Management recommendations
- Referring clinician details

This clinical audit was conducted in accordance with institutional policy at Prime Health Hub– DEW, Lahore. No interventions were performed, and all patient information was anonymized to ensure confidentiality. An exemption from full ethical review was granted by the institutional review board, as documented in the official letter from Prime Health Hub–DEW (Reference # PHH-IRB-001).

Statistical Analysis: Data were analysed using descriptive statistics. Categorical variables were summarized using frequencies and percentages. Observed performance was compared against predefined audit standards.

RESULTS

A total of 227 patient records were reviewed during the audit period. Fifty-six patients (24.7%) fulfilled NICE NG56 criteria for DEXA referral. Among eligible patients, only 28 (50.0%) were advised to undergo DEXA scanning, which was substantially below the predefined audit target of ≥90%. Of the 28 patients advised to undergo DEXA scanning, 17 (60.7%) completed the investigation, which also failed to meet the target completion rate of ≥80%. Fig.1.

DEXA Referral and Completion Cascade:

- Patients reviewed: 227
- Eligible for DEXA: 56
- Advised DEXA: 28
- Completed DEXA: 17

Quality of DEXA Report Documentation: Analysis of the 17 completed DEXA reports revealed substantial deficiencies in documentation quality.

DEXA Diagnostic Outcomes:

Among the 17 completed DEXA scans:

- 2 patients (11.8%) had normal bone mineral density.
- 11 patients (64.7%) had osteopenia.
- 4 patients (23.5%) had osteoporosis.

Overall, 88.2% of completed scans demonstrated abnormal findings, highlighting the clinical importance of appropriate osteoporosis screening and referral practices. (Fig 2)

Distribution of DEXA Findings:

- Normal: 11.8%
- Osteopenia: 64.7%
- Osteoporosis: 23.5%

DISCUSSION

This clinical audit identified significant deficiencies in both osteoporosis screening practices and DEXA report documentation within a specialized endocrine outpatient setting. Only half of eligible patients were advised to undergo DEXA scanning, and fewer than two-thirds of those advised completed the investigation. These findings suggest substantial gaps in the identification and assessment of patients at risk of osteoporosis.

The finding that 88.2% of completed DEXA scans demonstrated either osteopenia or osteoporosis underscores the effectiveness of guideline-based risk stratification in identifying patients at increased fracture risk. Similar observations have been reported in international studies,[7] where targeted screening

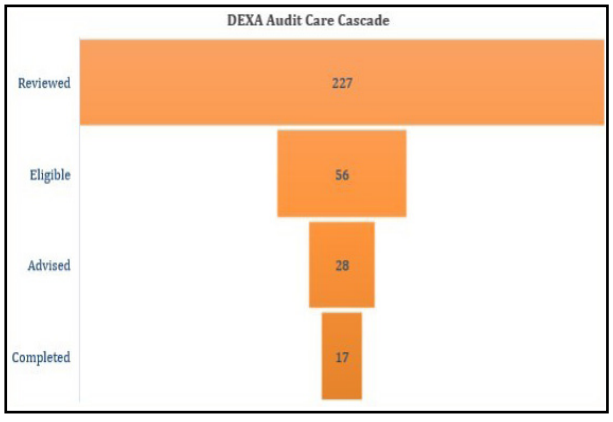

Fig.1: DEXA audit care cascade.

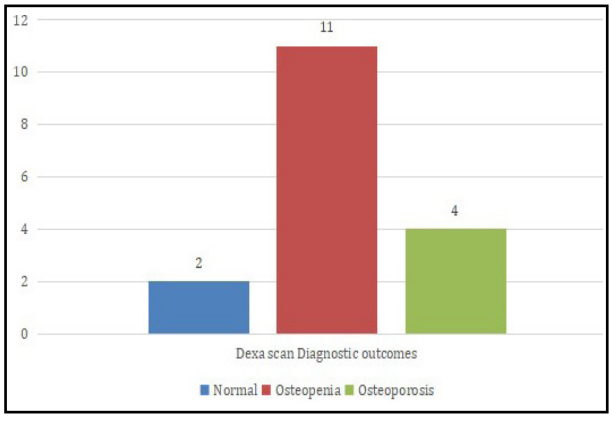

Fig.2: DEXA scan diagnostic outcomes.

of high-risk populations resulted in substantially higher diagnostic yields than opportunistic screening approaches. These findings reinforce the importance of adhering to established referral criteria to maximize the clinical utility of DEXA services and facilitate early intervention.[8]

The high prevalence of abnormal DEXA findings observed among completed scans is particularly noteworthy. Nearly nine out of ten patients undergoing DEXA demonstrated either osteopenia or osteoporosis. This finding suggests that many patients meeting guideline criteria represent a genuinely high-risk population and that missed referral opportunities may delay diagnosis and intervention.

Several factors may contribute to low referral rates. These include limited clinician awareness of screening criteria, competing clinical priorities during consultations, lack of standardized referral pathways, and inadequate integration of fracture risk assessment tools into routine practice. Similar barriers have been reported in previous studies evaluating osteoporosis screening programs.[9]

The quality of DEXA reporting was also suboptimal. The absence of documented indications, low rates of formal interpretation, and inconsistent use of FRAX calculations may reduce the clinical utility of DEXA reports. Comprehensive reporting is essential to facilitate risk stratification, guide treatment decisions, and ensure continuity of care.

Documentation of management plans and referring clinician information demonstrated comparatively higher compliance but still failed to achieve audit standards. These findings suggest the need for systematic improvements rather than isolated educational interventions.

Implementation of standardized referral forms incorporating FRAX assessment, structured DEXA reporting templates, and regular clinician education may enhance adherence to guideline recommendations. Integration of electronic prompts and mandatory reporting fields may further improve compliance and support quality improvement efforts.

Fracture Risk Assessment Tool (FRAX) calculations were documented in less than half of the reviewed reports despite being recommended for risk stratification and treatment decision- making. FRAX provides an estimate of the 10-year probability of major osteoporotic and hip fractures and is widely incorporated into contemporary osteoporosis management guidelines.[10] Failure to document FRAX assessments may lead to underestimation of fracture risk and inconsistent treatment recommendations. Incorporating FRAX into standardized referral and reporting templates may improve risk communication and support evidence-based management decisions.[11]

This audit evaluated both referral practices and reporting quality, providing a comprehensive assessment of osteoporosis care processes within a specialized endocrine clinic. However, several limitations should be acknowledged. The audit was conducted at a single center over a relatively short period and included a limited number of completed DEXA scans. The findings may therefore not be generalizable to other healthcare settings. Additionally, the retrospective design relied on available documentation, which may underestimate actual clinical practice if certain actions were performed but not recorded.

CONCLUSION

This clinical audit demonstrated poor adherence to NICE guideline recommendations for DEXA referral and substantial deficiencies in DEXA report documentation. A large proportion of patients meeting referral criteria were not advised to undergo DEXA scanning, and significant gaps were identified in reporting quality. The high prevalence of osteopenia and osteoporosis among completed scans highlights the importance of effective screening strategies. Standardized referral pathways, structured reporting templates, and targeted educational interventions are recommended to improve osteoporosis assessment and management in endocrine practice.

Quality Improvement Actions:

- Implement a standardized pre-DEXA referral proforma incorporating FRAX assessment.
- Introduce a structured DEXA reporting template.
- Establish mandatory consultant review of DEXA reports before release.
- Conduct periodic staff education sessions regarding osteoporosis risk assessment and NICE NG56 recommendations.
- Integrate electronic reminders and referral prompts into clinic workflows.

Re-Audit Plan: A re-audit should be conducted 2–4 months following the implementation of quality improvement measures to assess improvement in referral practices and reporting standards.

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Conflict of Interest: The authors declare no conflict of interest.

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Data Availability Statement: Data supporting the findings of this study are available from the corresponding author, Dr M. Talha Tahir, upon reasonable request. Access to the data will be granted in accordance with institutional policies and after ensuring that all patient identifiers remain anonymized to maintain confidentiality.

Ethical Approval: This audit was conducted in accordance with institutional policy. No patient identifiers were collected, and formal ethical approval was not required.

REFERENCES

1. National Institute for Health and Care Excellence. Osteoporosis: assessing the risk of fragility fracture. NICE Guideline NG56. London: National Institute for Health and Care Excellence; 2017. Available from: NICE Guideline NG56.
2. Kanis JA, McCloskey EV, Johansson H, Oden A, Ström O, Borgström F. Development and use of FRAX in osteoporosis. *Osteoporos Int*. 2010;21 Suppl 2:S407-13.
3. Compston J, Cooper A, Cooper C, Gittoes N, Gregson C, Harvey N, et al. UK clinical guideline for the prevention and treatment of osteoporosis. Arch Osteoporos. 2017;12(1):43.
4. World Health Organization. Prevention and management of osteoporosis. Geneva: WHO; 2003.
5. Shuhart CR, Yeap SS, Anderson PA, Jankowski LG, Lewiecki EM, Morse LR, et al. Executive summary of the 2019 ISCD position development conference on monitoring treatment, DXA cross-calibration and least significant change, spinal cord injury, peri-prosthetic and orthopedic bone health, transgender medicine, and pediatrics. *J Clin Densitom.* 2019;22(4):453-71.
6. Cosman F, de Beur SJ, LeBoff M, Lewiecki E, Tanner B, Randall S, et al. Clinician's guide to prevention and treatment of osteoporosis. Osteoporos Int. 2014;25(10):2359-81.
7. Curry SJ, Krist AH, Owens DK, Barry MJ, Caughey AB, Davidson KW, et al. Screening for osteoporosis to prevent fractures: US preventive services task force recommendation statement. *JAMA*. 2018;319(24):2521-31.
8. Harvey NC, McCloskey EV, Mitchell PJ, Dawson-Hughes B, Pierroz DD, Reginster JY, et al. Mind the (treatment) gap: a global perspective on current and future strategies for prevention of fragility fractures. *Osteoporos Int*. 2017;28(5):1507-29.
9. Leslie WD, Lix LM, Wu X; Manitoba Bone Density Program. Competing mortality and fracture risk assessment. *Osteoporos Int*. 2013;24(2):681-8.
10. Kanis JA, Harvey NC, Johansson H, Odén A, Leslie WD, McCloskey EV. FRAX update. *J Clin Densitom.* 2017;20(3):360-7.
11. Dickens LT, Jain RK. An update on the fracture risk assessment tool: what have we learned over 15+ years? *Endocrinol Metab Clin North Am*. 2024;53(4):531-45.

Author's Contribution:

MTT: Contributed to the conception and design of the audit, data collection, data interpretation, and manuscript drafting.
FA & AA: Contributed to data collection, data verification, and manuscript preparation.
ARN & UM: Provided clinical supervision, clinical review, methodological guidance, and final approval of the manuscript.