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Research

Evaluation of Orthopedic and Traumatology Diseases According to the 11th Revision of the International Classification of Diseases

Ortopedi ve Travmatoloji Hastalıklarının Uluslararası Hastalık Sınıflandırması 11. Revizyonuna Göre Değerlendirilmesi

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ABSTRACT

Objective: International Classification of Diseases (ICD) codes provide valuable and detailed information to measure the quality, effectiveness, and safety of healthcare services. This paper addresses the key differences between ICD-10 and ICD-11 in relation to orthopedics and traumatology, focusing on the main challenges orthopedic physicians may face during the transition to ICD-11 and offering potential solutions to these issues.

Methods: This study outlines the main headings and diseases of the ICD-10 guidelines published by the World Health Organization and the ICD-11 guidelines published in 2019. The orthopedic and traumatology sections were compared.

Results: In ICD-10, chapter numbering is done with Roman numerals, whereas in ICD-11, Arabic numerals are used for chapter numbering. In ICD-11, the main code has 4 characters and the first two characters consist of letters, and the last two characters consist of numbers. The number of main headings, which was 21 in ICD-10, was updated to 26+2 in ICD-11. In ICD-11, unlike ICD-10, health services related to traditional medicine are included in the last sections, and these services have been tried to be standardized internationally. In addition, separate sections for the evaluation of functioning and additional codes were included in sections V and X.

Conclusion: When ICD-11 is analyzed in terms of its general structure, the number of disease diagnoses has increased and a more comprehensive hierarchical structure is observed compared with ICD-10. It is an absolute fact that physicians in particular will experience difficulties during the transition to ICD-11.

Keywords: Health management, health sciences, international classification of diseases, digitalization of health, orthopedics and traumatology diseases

ÖZ

Amaç: Uluslararası Hastalık Sınıflandırması (ICD) kodları, sağlık hizmetlerinin kalitesini, etkinliğini ve güvenliğini ölçmek için önemli ve ayrıntılı bilgiler sunmaktadır. Bu makalede, ICD-10 ile ICD-11 arasındaki ortopedi ve travmatolojiye yönelik temel farklar ele alınmış, ortopedi hekimlerinin ICD-11'e geçiş sürecinde karşılaşabilecekleri zorluklar ve bu sorunların nasıl çözülebileceği üzerinde durulmuştur.

Gereç ve Yöntem: Bu çalışmada Dünya Sağlık Örgütü tarafından yayınlanmış olan ICD-10 kılavuzu ile 2019 yılında yayınlanan ICD-11 kılavuzunun ana başlıkları ve hastalıkları ana hatları ile incelendi. Ortopedi ve travmatolojiyi ilgilendiren bölümler birbiri ile karşılaştırıldı.

Bulgular: ICD-10'da bölüm numaralandırılması Roma rakamları ile yapılırken, ICD-11'de bölüm numaralandırılması için Arapça rakamlar kullanılmıştır. ICD-11'de ana kod 4 karakterlidir ve ilk iki karakter harflerden, son iki karakter sayılardan oluşmaktadır. ICD-10'da 21 olan ana başlık sayısı ICD-11'de 26+2 olarak güncellenmiştir. ICD-11'de ICD-10'dan farklı olarak son kısımlarda geleneksel tıp ile ilgili sağlık hizmetlerine yer verilmiş ve bu hizmetler uluslararası standardize edilmeye çalışılmıştır. Ayrıca V ve X bölümlerde işleyiş değerlendirilmesi ve ek kodlar için ayrı bölümlere yer verilmiştir.

Sonuç: ICD-11'in genel yapısı incelendiğinde, hastalık tanılarının sayısında artış olduğu ve ICD-10'a kıyasla daha kapsamlı bir hiyerarşik yapıya sahip olduğu görülmektedir. ICD-11'e geçiş sürecinde özellikle hekimler tarafından zorluk yaşanacağı mutlak bir gerçektir.

Anahtar Kelimeler: Sağlık yönetimi, sağlık bilimleri, hastalıkların uluslararası sınıflandırılması, sağlığın dijitalleşmesi, ortopedi ve travmatoloji hastalıkları

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INTRODUCTION

Insurance companies, health information technology professionals, government agencies, and coders use the International Classification of Diseases (ICD) to properly record morbidity and mortality data, monitor epidemiological data, and help with medical reimbursement decisions. ICD codes provide useful and more detailed information for measuring the quality, effectiveness, and safety of healthcare services. The World Health Organization (WHO) publishes and contributes to the development of ICD codes (1). The WHO releases minor updates every year and major updates every 3 years. With each update that attempts to eliminate deficiencies, new codes provide more detailed information about the patient's condition. For example, while the right and left sides cannot be distinguished in patients with a distal radius fracture using ICD-9, this distinction can be made using ICD-10 codes. Similarly, volar or dorsal injury is not distinguished in a patient with a distal radius fracture in ICD-10, whereas volar and dorsal injuries are coded in two different ways in ICD-11.

WHO announced the 11th version of the ICD on its website and social media platform on June 18, 2018. Many diseases and disorders are included in ICD-11. In addition, signs and symptoms related to diseases, syndromes, injuries, external causes of illness, and death are also included in the new update. All codes in ICD-11 are presented in 26 main headings and two supplementary sections (V and X). Unlike ICD-10, health services related to traditional medicine were included in the latter sections, and these services were tried to be internationally standardized. In addition, separate sections are included for functioning assessment and extension codes in the supplementary sections V and X (2).

In this article, we aimed to evaluate the diseases related to the orthopedics and traumatology section in the ICD-11 guidelines and to help physicians initiate their transition to ICD-11.

METHODS

The study involved a comparison of ICD-10 and ICD-11 classifications, analyzing the changes introduced by the new classification system.

The research was conducted using literature review and document analysis methods. Data were obtained by examining the ICD-11 guidelines published by the WHO and official health coding systems. The differences between ICD-10 and ICD-11 were identified, with a particular focus on diagnostic and coding changes in the field of orthopedics and traumatology. Since no living organisms were used in this study, ethics committee approval was not required.

RESULTS

The main sections of ICD-10 and ICD-11 are presented in (Table 1). While chapter numbering in ICD-10 uses Roman numerals, Arabic numerals are used for chapter numbering in ICD-11. ICD-10 comprises 21 main headings and is generally classified according to parameters such as anatomical region and disease agent. The ICD-10 coding has 5 digits. The coding system employs an alphanumeric system that includes a letter in the first digit and a number in the other digits. The first step comprises the main heading, while the second and third steps contain the numbers formed by the combination of certain diseases. The fourth digit follows a decimal number and allows for more detailed disease coding. The fifth digit indicates a new disease or special condition. For example, for a patient with joint pain to be coded according to ICD-10, the main heading "diseases of the musculoskeletal system and connective tissue" should be selected, followed by the subheading of this section "other joint disorder, not elsewhere classified" with the letter "M" and the number "25". The fourth digit must then be selected. In the fourth step, an appropriate choice should be made. According to the ICD-10 classification, the code for joint pain is "M25.5." In special cases, a fifth level can be added (2).

ICD-11 is being developed within an interactive and constantly updating beta draft system (3). The number of main headings, which was 21 in ICD-10, was updated to 26+2 in ICD-11. The main heading of "diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism" in ICD-10 is divided into two main headings as "diseases of the blood or blood-forming organs" and "diseases of the immune system" in ICD-11. The main heading of "mental and behavioral disorders" in ICD-10 is divided into three main headings in ICD-11 as "mental, behavioral, or neurodevelopmental disorders", "sleep-wake disorders" and "conditions related to sexual health." In case of the emergence of new diseases, a section on "Codes for special purposes" has been created in ICD-11. For diseases related to traditional medicine, the heading "supplementary chapter traditional medicine conditions-module I" has been created. To evaluate the cognition status of the patients, the heading "supplementary section for functioning assessment" was created. In addition, the heading of "extension codes" has been added to detail conditions such as the severity of the disease, the patient's state of consciousness, and cause of infection (2,3).

In ICD-11, the main code consists of 4 characters; the first two characters are letters and the last two are numbers. Adding a mandatory number in place of the third character prevents unwanted words from being written. A letter in place of the second character provides a clear distinction between ICD-11 and ICD-10 codes. Alphanumeric codes cover the range of 1A00.00 to ZZ9Z.ZZ. Codes starting with "X" indicate an extension code. The letters "O" and "I" have been omitted to avoid confusion with the numbers "0" and "1." The first character of the code is always related to the section. For sections 01 to 09, the first character is a number between 1 and 9, while for sections 10 to 26, the first character is a letter. The code range in a single section always has the same character in the first position. For example, 1A00 is a code in section 01, AA00 is a code in section 10, BA00 is in section 11, and CA00 is a code in section 12. The last letter Y is reserved for the category "other specified" and the last letter Z is reserved for the category "unspecified." For example, the coding for a first metacarpal basal fracture according to ICD-11 will be listed under the main section "injury, poisoning or certain other consequences of external causes" in the "injuries to the wrist or hand" subsection as a "first metacarpal fracture" using an NC prefix. In summary, the first metacarpal fracture is coded as NC53.2 according

Table 1. ICD-10 and ICD-11 main sections

ICD-10 main sections	ICD-11 main sections
I. Infectious and parasitic diseases	1. Certain infectious or parasitic diseases
II. Neoplasms	2. Neoplasms
III. Diseases in the blood and blood-forming organs and certain disorders involving the immune mechanism	3. Diseases of the blood and blood-forming organs
IV. Endocrine, nutritional, and metabolic diseases	4. Diseases of the immune system
V. Mental and behavioral disorders	5. Endocrine, nutritional, and metabolic diseases
VI. Diseases of the nervous system	6. Mental, behavioral, or neurodevelopmental disorders
VII. Diseases of the eye and adnexa	7. Sleep-wake disorders
VIII. Diseases of the ear and mastoid process	8. Diseases of the nervous system
IX. Diseases of the circulatory system	9. Diseases of the visual system
X. Diseases of the respiratory system	10. Diseases of the ear or mastoid process
XI. Diseases of the digestive system	11. Diseases of the circulatory system
XII. Diseases of the skin and subcutaneous tissue	12. Diseases of the respiratory system
XIII. Diseases of the musculoskeletal system and connective tissue	13. Diseases of the digestive system
XIV. Diseases of the genitourinary system	14. Skin diseases
XV. Pregnancy, childbirth, and puerperium	15. Diseases of the musculoskeletal system or connective tissue
XVI. Conditions originating in the perinatal period	16. Diseases of the genitourinary system
XVII. Congenital malformation, deformation, and chromosomal abnormalities	17. Conditions related to sexual health
XVIII. Symptoms, signs, and abnormal clinical and laboratory findings, not classified elsewhere	18. Pregnancy, childbirth, or puerperium
XIX. Injury, poisoning, and certain other consequences of external causes	19. Certain conditions originating in the perinatal period.
XX. External causes of morbidity and mortality	20. Developmental anomalies
XXI. Factors influencing health status and contact with health services	21. Symptoms, signs, or clinical findings not classified elsewhere
XXII. Codes for special purposes	22. Injury, poisoning, or certain other consequences of external causes
	23. External causes of morbidity and mortality
	24. Factors influencing health status or contact with health services
	25. Codes for special purposes
	26. Supplementary chapter: Traditional medicine conditions
	V. Supplementary section for functioning assessment
	X. Extension codes

ICD: The International Classification of Diseases

to ICD-11. In addition, if requested, the side of the fracture (right, left, bilateral, etc.), the subtype of the fracture (avulsion, compression, greenstick fracture, etc.), whether it is an open or closed fracture, joint involvement, the specific region of the fracture, and related conditions (beating, self-harm, ill-treatment, etc.) can also be coded (Figures 1, 2).

For certain diseases, it is important to define both the etiology and manifestation. This is particularly important in mortality coding. In ICD-10, a dagger symbol was placed next to the etiology codes, and a star symbol was placed next to the finding codes. The dagger and asterisk system has been removed in ICD-11, but the functionality of coding the etiology and manifestation remains. A number of former asterisk codes that were previously used to identify disease manifestations are now listed in Chapter 21 "symptoms, signs, or clinical findings, not elsewhere classified". A portion of the former asterisk codes also reside in the

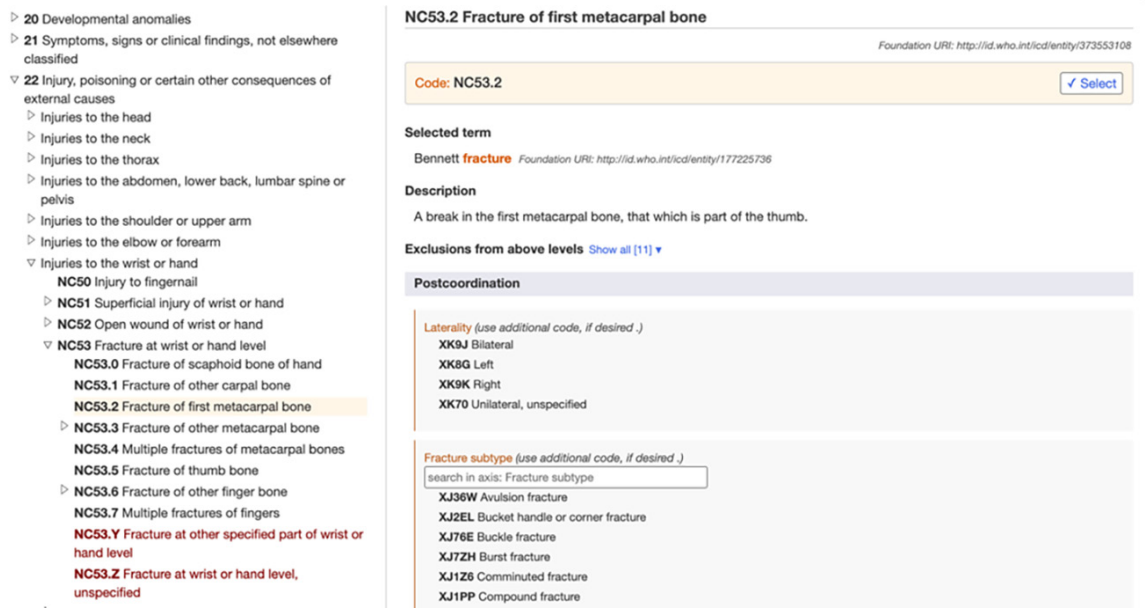

Figure 1. ICD-11 coding for first metacarpal fracture
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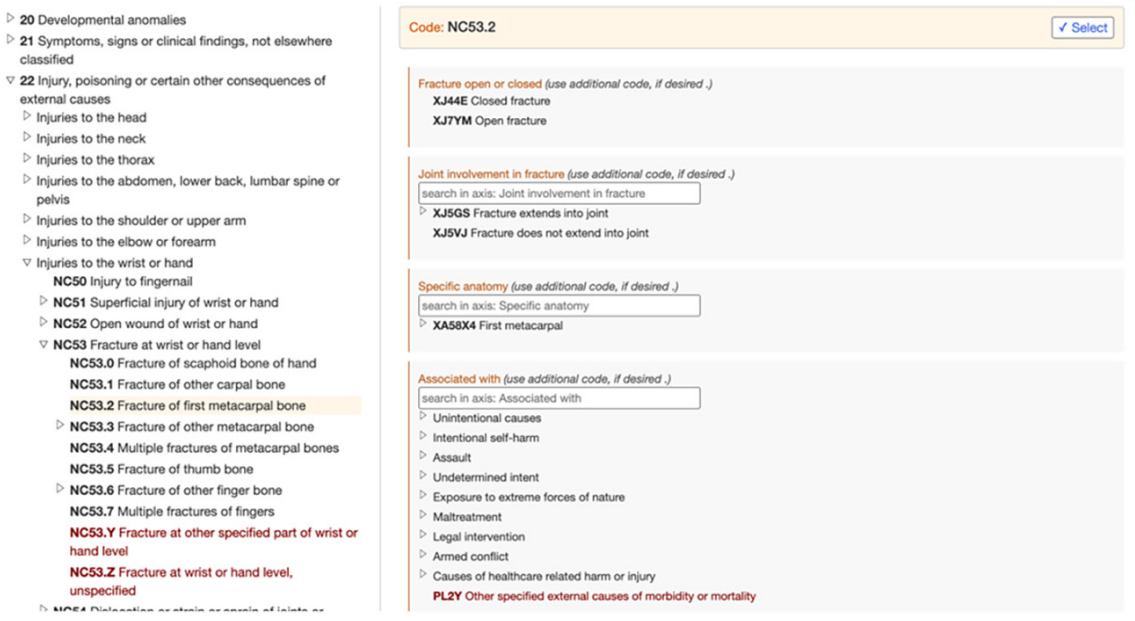

Figure 2. ICD-11 coding for first metacarpal fracture
ICD: The International Classification of Diseases

corresponding body system chapter. Asterisk codes that were repetitions of the dagger code were removed. Lists for coding optional anatomical details have been grouped into one section in Chapter X "extension codes" (2).

Topics concerning orthopedics and traumatology in ICD-11 are mainly "neoplasms" in Chapter 2, "diseases of the musculoskeletal system or connective tissue" in Chapter 15, "Developmental anomalies" in Chapter 20, "symptoms, signs or clinical findings, not elsewhere classified" in Chapter 21, and "injury, poisoning or certain other consequences of external causes" in Chapter 22 (2).

The "neoplasms" section in ICD-11 was created to code diseases of abnormal or uncontrolled cell proliferation that are not coordinated with an organism's requirements for normal tissue growth, change, or repair. For example, the ICD-11 diagnostic code for multiple myeloma is 2A83.1, and the coding scheme is shown in (Figure 3). In addition, internal and external diagnoses are listed under the same tab. The same disease was coded as C90.0 in ICD-10 (Figure 4). Certain types of morphology previously included in Annex-A of ICD-10 are included in this section of ICD-11. In the orthopedics and traumatology sections, all hematopoietic and lymphoid tissues were grouped together, and "malignant mesenchymal neoplasms" were added as a new group. The differences between ICD-10 and ICD-11 in the "neoplasms" section are presented in (Table 2).

Chapter 15 of ICD-11 is entitled "Diseases of the musculoskeletal system or connective tissue." The "systemic connective tissue disorders" subsection in ICD-10 has been moved to the fourth section named "diseases of the immune system" in ICD-11. "Soft tissue disorders, unspecified," which is frequently referred to in orthopedics and traumatology outpatient clinics, is coded in this section. This diagnosis is coded as M79.9 in ICD-10 and FB6Z in ICD-11. The differences between Chapters 15 of ICD-10 and ICD-11 are presented in (Table 3).

Chapter 21 of ICD-11 was created to provide a definitive diagnosis for less defined conditions and symptoms in cases in which necessary studies were avoided. This section has been largely restructured using a top-level hierarchy. Some clinical forms previously included in other sections as star codes have been moved to this section under ICD-11. Unlike ICD-10, diseases related to orthopedics and traumatology are coded in more detail under the subheading of 'Symptoms, signs or clinical findings of the musculoskeletal system' in Chapter 21 of ICD-11. For example, the diagnosis of "clicking hip" is coded as "M24.8: Other specific joint derangements, not elsewhere classified" under the main title of "XIII." Diseases of the musculoskeletal system and connective tissue" in ICD-10, coded as "ME80: Clicking hip" in Section 21 in ICD-11. The differences between Chapters 21 of ICD-10 and ICD-11 are presented in (Table 4).

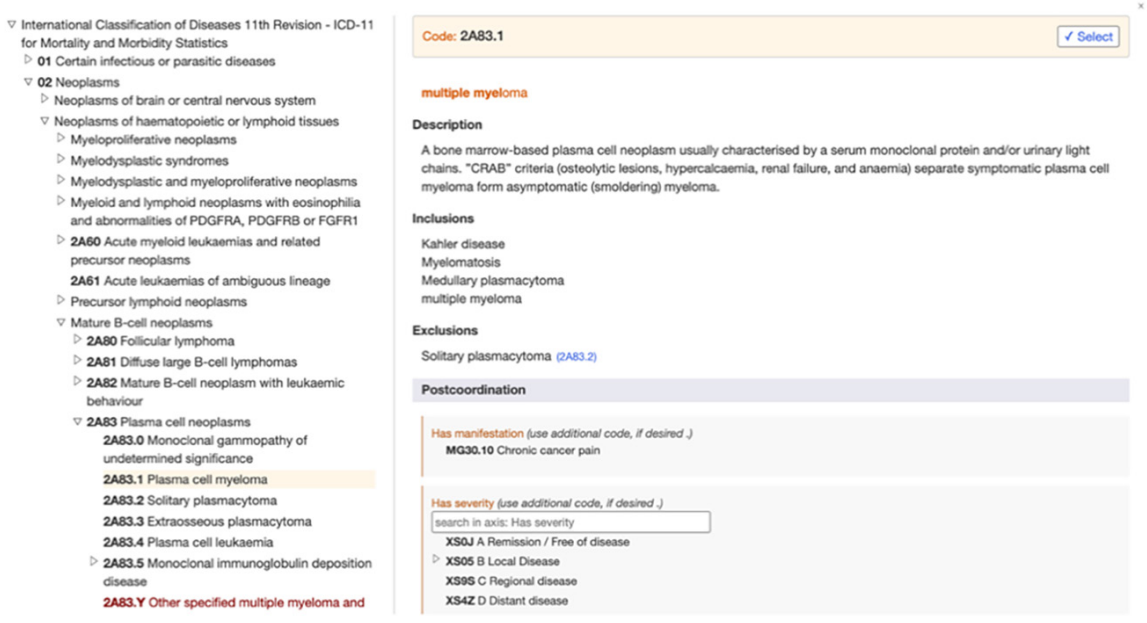

Figure 3. ICD-11 diagnostic code chart of multiple myeloma
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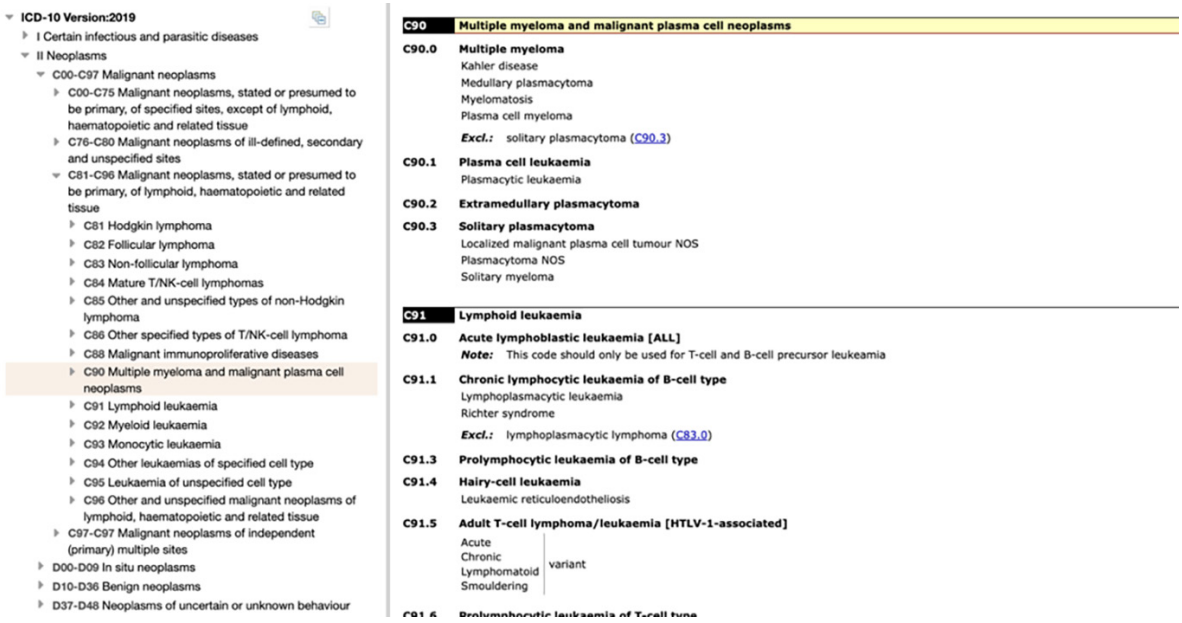

Figure 4. ICD-10 diagnostic code chart of multiple myeloma
ICD: The International Classification of Diseases

Table 2. Comparison of ICD-10 block structure with ICD-11 equivalent structure

ICD-10 block heading	ICD-11 equivalent structure
C00-C97 malignant neoplasms	Neoplasms of the brain or central nervous system Neoplasms in hematopoietic or lymphoid tissues malignant neoplasms, except for lymphoid, hematopoietic, central nervous system, or related tissues
D00-D09 *in situ* neoplasms	*In situ* neoplasms, except for lymphoid, hematopoietic, central nervous system, or related tissues
D10-D36 benign neoplasms	Benign neoplasms, except for lymphoid, hematopoietic, central nervous system, or related tissues
D37-D48 neoplasms with uncertain or unknown behavior	Neoplasms of uncertain behavior, except for lymphoid, hematopoietic, central nervous system, or related tissues Neoplasms of unknown pathology, except for lymphoid, hematopoietic, central nervous system, or related tissues

ICD: The International Classification of Diseases

Table 3. Comparison of ICD-10 block structure with ICD-11 equivalent structure

ICD-10 block heading	ICD-11 equivalent structure
M00-M25 Arthropathies	Arthropathies
M30-M36 systemic connective tissue disorders	Moved to Chapter 04 "diseases of the immune system"
M40-M54 dorsopathies	Conditions associated with the spine
M60-M79 soft tissue disorders	Soft tissue disorders
M80-M94 osteopathy and chondropathia	Osteopathy and chondropathia
M95-M99 other disorders of the musculoskeletal and connective tissue	Redistributed to various groupings, including certain specified acquired deformities of the musculoskeletal system or connective tissue, not elsewhere classified, and postprocedural musculoskeletal disorders, not elsewhere classified

ICD: The International Classification of Diseases

Table 4. Comparison of ICD-10 block structure with ICD-11 equivalent structure

ICD-10 block heading	ICD-11 equivalent structure
R00-R09 symptoms and signs involving the circulatory and respiratory systems	Split into two groups: Symptoms, signs, or clinical findings of the circulatory system; symptoms, signs, or clinical findings of the respiratory system
R10-R19 symptoms and signs involving the digestive system and abdomen	Symptoms, signs, and clinical findings of the digestive system or abdomen
R20-R23 symptoms and signs involving the skin and subcutaneous tissue	Split into two groups: Symptoms, signs, or clinical findings of the nervous system; symptoms, signs, or clinical findings of the musculoskeletal system
R30-R39 symptoms and signs involving the urinary system	Symptoms, signs, or clinical findings of the genitourinary system: Part of the grouping Symptoms, signs, or clinical findings of the genitourinary system
R40-R46 symptoms and signs involving cognition, perception, emotional state, and behavior	Reorganized into various subsections under mental or behavioral symptoms, signs or clinical findings
R47-R49 symptoms and signs involving speech and voice	Symptoms, signs, and clinical findings of speech and voice
R50-R69 general symptoms and signs	General symptoms, signs, and clinical findings
R70-R79 abnormal findings on blood examination without diagnosis	Included in the grouping symptoms, signs, or clinical findings of blood, blood-forming organs, or the immune system
R80-R82 abnormal findings on urine examination without diagnosis	Clinical findings on urine examination, without diagnosis under the grouping of symptoms, signs, or clinical findings involving the urinary system
R83-R89 abnormal findings on examination of other body fluids, substances, and tissues without diagnosis	Clinical findings in specimens from other specified organs, systems, and tissues under the general symptoms, signs, or clinical findings
R90-R94 abnormal findings on diagnostic imaging and in functional studies without diagnosis	Split into two subsections: Abnormal diagnostic imaging results not elsewhere classified; abnormal results of function studies of other organs and systems in the grouping abnormal results not elsewhere classified
R95-R99 Ill-defined and unknown causes of mortality	Ill-defined and unknown causes of mortality

ICD: The International Classification of Diseases

DISCUSSION

The ICD guideline is in wide use worldwide. It facilitates the recording, analysis and interpretation of mortality and morbidity data collected at different times in different countries and regions of the world. Thanks to this guideline, the archiving system and data collection processes are standardised and used in large studies. The resulting data provide critical information on the causes and consequences of diseases and deaths in the world.

Determination of causes of death and their grouping, evaluation of health services, archiving of records of cancer diseases, clinical research and evaluation of epidemiological studies can be done thanks to the ICD guideline.

As in all fields, it has become inevitable to analyze and document data on diseases and deaths in response to a certain code also in the field of health. Since ancient times, people have tried to statistically collect diseases and deaths in the field of health and archive them within the framework of certain rules. As a result of this archiving, the creation of the ICD guideline was inevitable (2,4).

Since the publication of the ICD-10 guidelines, there have been some changes in the subdivisions of the diagnoses and treatments of orthopaedic and traumatology diseases. As a result of these changes and due to the development of technology, the need for a new algorithm to classify diseases has arisen. When ICD-11 is analysed in terms of its general structure, it is seen that the number of disease diagnoses has increased and there is a more comprehensive hierarchical structure compared to ICD-10. In the coding of the diseases related to orthopaedics and traumatology department, while the main code according to ICD-10 is 3 digits, the main code according to ICD-11 is arranged as 4 digits. In ICD-10, some diseases related to the orthopaedics department could not be coded correctly. However, with ICD-11, it is seen that this has been eliminated in many diseases and a more detailed coding has been created in the classification of diseases. Nevertheless, although some deficiencies may arise in the future regarding the use of the ICD-11 guideline, these deficiencies will be eliminated with new updates (2).

One of the main objectives of ICD-11 is to classify diseases in a more standardised way and to carry this statistical data to the future in a more appropriate way. It is an absolute fact that especially physicians will experience difficulties during the transition to ICD-11. It is not yet known exactly when the health sysstem in Türkiye will switch to this new system.

The transition from ICD-10 to ICD-11 has introduced significant structural and functional improvements, particularly in the classification of orthopedic and traumatology diseases. With an expanded and more detailed coding system, ICD-11 provides a more comprehensive framework for disease classification, addressing many of the limitations present in ICD-10. The increased number of disease categories, the improved hierarchical structure, and the integration of supplementary codes allow for more precise diagnosis and documentation.

CONCLUSION

Despite these advancements, the transition to ICD-11 presents challenges, particularly for physicians and healthcare professionals who need to adapt to the new coding system. The complexity of implementation, training requirements, and potential inconsistencies in early adoption may pose difficulties in daily clinical practice. However, as healthcare systems worldwide gradually integrate ICD-11, continuous updates and refinements will help streamline the process and enhance the accuracy of disease classification. Overall, ICD-11 represents a crucial step toward the digitalization and standardization of health information, contributing to more efficient health management and epidemiological research. Future updates and modifications will be essential to further optimize its use in orthopedics and traumatology.

ETHICS

Ethics Committee Approval: Since no living organisms were used in this study, ethics committee approval was not required.

Informed Consent: Since this study was not conducted on humans, patient consent was not required.

FOOTNOTES

Financial Disclosure: No financial support has been received for the preparation of this manuscript.

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