

# High Blood Pressure and Diabetes: Epidemiological and Clinical Aspects and Management in 132 Patients Admitted to the Sino-Guinean Friendship Hospital

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## Abstract

**Introduction:** Arterial hypertension (HTN) and diabetes mellitus are two of the leading chronic non-communicable diseases (NCDs) worldwide and represent major risk factors for cardiovascular, renal, and cerebrovascular diseases. The coexistence of hypertension and diabetes in the same patient significantly increases the risk of cardiovascular complications, chronic kidney disease, and premature mortality. The objective of this study was to describe the epidemiological and clinical profile and management of patients admitted to the Sino-Guinean Friendship Hospital for hypertension and diabetes. **Methodology:** This was a descriptive cross-sectional study conducted over a period of six months, from December 13, 2022 to June 13, 2023 of the Sino-Guinean Friendship Hospital. The study population included all patients admitted for outpatient consultations and hospitalized in cardiology departments and then in medical emergencies for arterial hypertension and diabetes. **Results:** Out of a total of 5068 consultations recorded during the study period, 132 patients presented with a combination of diabetes and hypertension, representing approximately 2.6% of all consultations. The 61 - 67 years age group was the

most represented, accounting for 26.5% of participants. The distribution according to socio-professional category showed a predominance of housewives (30.0%). Most patients were managed in the cardiology department, which accounted for 36.4% of cases. The main reasons for consultation at admission were palpitations (18.0%), followed by polydipsia (17.0%), polyuria (16.0%), and polyphagia (14.0%). Stroke was the most frequent complication (14.0%), followed by renal failure (12.0%). Metformin was the most commonly used antidiabetic drug (64.6%), in accordance with international recommendations for the initial treatment of type 2 diabetes. The majority of patients (60.6%) showed a favorable outcome, reflecting a good response to treatment and effective management. **Conclusion:** The coexistence of hypertension and diabetes mainly affects middle-aged and older adults, with a predominance of type 2 diabetes and severe complications such as stroke and renal failure.

## Keywords

Hypertension, Type 2 Diabetes, Complications, Management, Conakry

## 1. Introduction

High blood pressure (HBP) and diabetes mellitus are two of the leading chronic noncommunicable diseases (CNCDs) worldwide and constitute major risk factors for cardiovascular, renal, and cerebrovascular diseases [1] [2]. According to the World Health Organization (WHO), more than 1.28 billion people worldwide have hypertension, the majority of whom live in low- and middle-income countries [3]. At the same time, the prevalence of diabetes is rising rapidly, with more than 537 million adults affected in 2021, nearly half of whom remain undiagnosed [4].

The coexistence of hypertension and diabetes in the same patient significantly increases the risk of cardiovascular complications, chronic kidney disease, and premature mortality [5]. This association, often referred to as “cardiometabolic syndrome”, complicates therapeutic management and requires an integrated approach combining lifestyle and dietary measures, regular clinical monitoring, and combination drug therapy [6]. In Guinea, the prevalence of hypertension and diabetes is on the rise, particularly in urban areas, due to the epidemiological transition, rapid urbanization, and the adoption of risk behaviors such as a sedentary lifestyle and unhealthy eating habits [7] [8]. However, local data on the management of patients with both hypertension and diabetes remain limited. Challenges include delayed diagnosis, poor treatment adherence, and limited access to appropriate combination therapies [9].

The Sino-Guinean Friendship Hospital, as a referral center, receives a significant number of patients with hypertension and diabetes, providing an opportunity to evaluate care and identify clinical and organizational barriers.

The objective of this study was to describe the epidemiological and clinical pro-

file and management of patients admitted for outpatient consultations and hospitalized in cardiology departments and then in medical emergencies for arterial hypertension and diabetes to the Sino-Guinean Friendship Hospital.

**Methodology:** This was a descriptive cross-sectional study conducted over a 6-month period from December 13, 2022, to June 13, 2023.

The study population included all patients admitted for outpatient consultations and hospitalized in cardiology departments and then in medical emergencies for arterial hypertension and diabetes.

**Data collection, analysis, and presentation of results:**

Data were collected through: direct interviews and physical examinations of patients, biological and biochemical analyses, medical imaging studies, and admission and hospitalization records.

The Blood pressure was measured in both arms of a patient at rest, and hypertension was diagnosed if systolic blood pressure (SBP) was greater than or equal to 140 mmHg and/or diastolic blood pressure (DBP) was greater than or equal to 90 mmHg at first contact, and in patients with known well-controlled hypertension under antihypertensive treatment.

Diabetes was diagnosed in a patient whose fasting blood glucose level was equal to or greater than 1.26 g/l or 7 mmol/l of blood on two successive tests, or if the patient was known to be diabetic and under medical treatment with insulin and/or oral antidiabetic drugs.

Data were entered into a pre-designed survey form for each patient on Kobocollecte, then transferred to Kobotoolbox for data cross-referencing, and subsequently imported into SPSS software for analysis.

This data included epidemiological, clinical, and paraclinical information such as: age, sex, occupation, residence, history of hypertension, history of diabetes, coronary artery disease, renal insufficiency, grades of hypertension, types of diabetes, types of complications, and clinical course.

**Challenges:** The main challenges and limitations encountered during our study were: the refusal of some patients to participate in the study; occasional delays in obtaining the results of additional tests; the absence of a medical service or unit for endocrinology and metabolic diseases within the Sino-Guinean Friendship Hospital in Kipé would be the cause of the non-hospitalization or consultation of some diabetic patients.

**Ethical considerations:** Informed consent was obtained from patients, medical confidentiality was respected, and the data from this study were used for medical purposes.

The scientific committee, which also assumes the function of the ethics committee of the Sino-Guinean Friendship Hospital, approved this study and gave its favorable opinion.

## 2. Results

Of the 5068 patients seen in outpatient consultations and hospitalized in the car-

diology and emergency departments during the study period, 132 presented with both diabetes and hypertension, representing approximately 2.6% of all consultations. with a male majority (60%) and a male-to-female ratio of 1.5 (**Figure 1**).

The 61 - 67 age group was the most represented, accounting for 26.5% of participants.

The distribution of patients by socioeconomic category shows a predominance of homemakers (30.0%), followed by civil servants (22.0%) and shopkeepers (16.0%).

The majority of patients came from urban areas, representing 83.3% of the total sample, compared to 16.7% from rural areas.

The majority of patients were married, accounting for 84.0% of the total sample, while widowed individuals constituted 12.0% of cases. Unmarried and divorced patients were underrepresented, at 3.0% and 1.0%, respectively.

The majority of patients were treated in the cardiology department, which accounted for 36.4% of cases, reflecting the prevalence of cardiovascular conditions in the study population. The emergency department also accounted for a significant proportion (23.5%).

The majority of patients did not require hospitalization, accounting for 61.4% of the total cohort, while 38.6% were treated in a hospital setting.

The primary reasons for consultation at admission were dominated by palpitations (18.0%), followed by polydipsia (17.0%), polyuria (16.0%), and polyphagia (14.0%). The significant presence of lower limb edema (8.0%) and syncope (6.0%) indicates hemodynamic compromise in a significant proportion of patients. Loss of consciousness (5.0%), although less frequent, constitutes a serious reason for consultation requiring urgent management.

The majority of patients were classified as having Grade I hypertension (46.0%), followed by those with Grade II hypertension (33.0%). Severe Grade III hypertension accounted for 10% of cases, while individuals with high-normal blood pressure constituted 9% and isolated systolic hypertension 1% (**Table 1**).

The vast majority of patients (91.7%) had type 2 diabetes, while type 1 diabetes accounted for only 8.3% of cases (**Table 2**).

The complications observed in diabetic patients were diverse and primarily affected the neurological, cardiovascular, and renal systems. Strokes were the most common (14.0%), followed by renal failure (12.0%) and heart failure (11.0%). The presence of neuropathy (10.0%) and retinopathy (7.0%) reflects the long-term impact of diabetes on target organs.

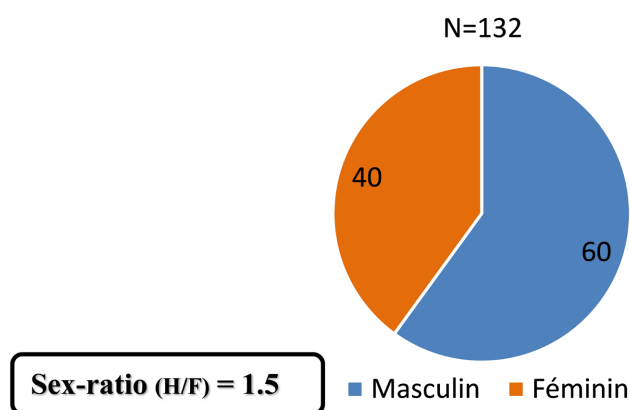
Urinalysis was not performed in 58.3% of patients at admission, which limits the initial assessment of metabolic and renal complications of diabetes.

Among the patients tested, glycosuria was the most common finding (19.5%), followed by the combination of glycosuria and proteinuria (12.7%) and glycosuria, ketonuria, and proteinuria (6.0%). Cases of isolated or combined ketonuria were rare (2.5%), while isolated proteinuria was exceptional (1.0%).

Metformin was the most commonly used antidiabetic agent (64.6%).

The most commonly used antihypertensive treatment was ACE inhibitors alone (35.6%), followed by ACE inhibitor + diuretic combinations (11.4%) and ACE inhibitor + beta-blocker combinations (9.8%). More complex combinations (triple and quadruple therapies) accounted for a smaller proportion ( $\leq 7.6\%$  each). ARB IIs were prescribed less frequently (5.3% for all combinations including them), while 22% of patients received other diverse treatments (Table 3).

A predominant proportion of patients (60.6%) showed a favorable outcome. Nevertheless, nearly one-third of patients (31.1%) developed complications (Table 4). The mortality rate was 8.3%, this highlights the significant severity of the condition under study and underscores the need for close clinical monitoring and continuous optimization of treatment strategies (Table 5).



**Figure 1.** Distribution of the hypertension-diabetes comorbidity by gender in the study population.

**Table 1.** Distribution of patients by hypertension stage according to the JNC.

Blood pressure level	Number	Percentage
Grade I	62	46.0
Grade II	44	33.0
Grade III	13	10.0
Normal High	12	9.0
Isolated Systolic Hypertension	1	1.0
<b>Total</b>	<b>132</b>	<b>100.0</b>

NC: Joint National Committee.

**Table 2.** Breakdown of patients by type of diabetes.

Types of diabetes	Numbers	Percentage
2	121	91.7
1	11	8.3
<b>Total</b>	<b>132</b>	<b>100.0</b>

**Table 3.** Breakdown of patients by antidiabetic medication taken.

Types of antidiabetic drugs	Number	Percentage
Metformine	85	64.6
Diamicron	10	7.6
Novomix	5	3.7
Lantus	4	3
Mixtard	5	3.7
Actrapid	5	3.7
Gliclazide	2	1.5
Others	16	12.2
<b>Total</b>	<b>132</b>	<b>100</b>

Others: Daonil, Januvia, Galvus, Ozempic.

**Table 4.** Breakdown of patients by complications.

Complications	Number	Percentage
Stroke	19	14.0
Renal Failure	16	12.0
Heart Failure	14	11.0
Encephalopathy	11	8.0
Retinopathy	9	7.0
Diabetic acidose	10	8.0
Diabetic Neuropathy	13	10.0
Obliterative arteriopathy of the lower limbs	10	8.0
Acute pulmonary edema	9	6.0
Myocardial infarction	6	5.0
Others complications	15	11.0
<b>Total</b>	<b>132</b>	<b>100%</b>

Other complications: septic shock, anaphylactic shock, hypovolemic shock.

**Table 5.** Distribution of patients by clinical course.

Evolution	Number	Percentage
Favorable	80	60.6
Complications	41	31.1
Death	11	8.3
<b>Total</b>	<b>132</b>	<b>100</b>

### 3. Discussion

Of a total of 5068 consultations recorded during the study period, 132 patients

had both diabetes and hypertension, representing approximately 2.6% of all consultations.

Compared to data from other African countries, this prevalence in our series appears relatively low compared to estimates from continental studies. For example, in Cameroon, Sylvain Raoul *et al.* observed that 76.96% of participants had at least one comorbidity [10]. In Nigeria, studies conducted in internal medicine departments reported rates ranging from 5% to 12% [11] [12]. These differences may be explained by methodological factors (study population, inclusion criteria), the availability and accessibility of care, as well as underreporting of conditions in certain settings.

The study population consisted mainly of older adults and the 61 - 67 age group was the most represented, accounting for 26.5% of participants. Overall, individuals aged 53 and older accounted for more than two-thirds of the total sample, reflecting a high concentration of cases among older individuals. The relatively high mean age (59.41 years) combined with a moderate standard deviation ( $\pm 12.60$  years) indicates a distribution centered around the fifties and sixties.

In Nigeria, BO Bello-Ovosi *et al.* reported the mean age of participants was  $51.0 \pm 14.0$  years and 87.8% were females among patients with this comorbidity [13]. In Côte d'Ivoire, Kouassi *et al.* observed a predominance of patients aged 55 to 70 years, who accounted for the majority of cases hospitalized for diabetes and hypertension [10].

These observations suggest that on the African continent, the diabetes-hypertension association particularly affects middle-aged adults and the elderly, hence the need for targeted surveillance and appropriate management for this population at high risk of cardiometabolic complications.

The majority of patients came from urban areas, accounting for 83.3% of the total sample, compared with 16.7% from rural areas. This clear urban predominance suggests greater access for urban populations to specialized healthcare facilities, as well as greater utilization of healthcare services [14].

The majority of patients were married, accounting for 84.0% of the total sample, while widowed individuals made up 12.0% of the cases. Unmarried and divorced patients were underrepresented, at 3.0% and 1.0%, respectively.

The majority of patients were treated in the cardiology department, which accounted for 36.4% of cases, reflecting the prevalence of cardiovascular conditions in the study population. The emergency department also accounted for a significant proportion (23.5%), suggesting an acute onset or clinical severity requiring immediate care.

The majority of patients did not require hospitalization, accounting for 61.4% of the total cohort, while 38.6% were treated in a hospital setting. This distribution suggests that, in the majority of cases, the condition under study could be managed on an outpatient basis, reflecting moderate clinical severity in a significant proportion of patients.

This finding is consistent with data from Africa, where the majority of patients

with hypertension or diabetes are treated on an outpatient basis, but a significant proportion require hospitalization due to acute complications or associated comorbidities [12] [15].

The most common reasons for consultation at admission were palpitations (18.0%), followed by polydipsia (17.0%), polyuria (16.0%), and polyphagia (14.0%); the significant presence of lower limb edema (8.0%) and syncope (6.0%) indicates hemodynamic compromise in a significant proportion of patients. Loss of consciousness (5.0%), although less frequent, constitutes a serious reason for consultation requiring urgent management.

Our findings are consistent with certain African studies that have shown a higher prevalence of classic metabolic symptoms of diabetes, particularly polyuria and polydipsia, which can reach 20% - 25% of cases, as well as hemodynamic signs (lightheadedness, edema) [10] [16].

The majority of patients were classified as having Grade I hypertension (46.0%), followed by those with Grade II hypertension (33.0%). Severe Grade III hypertension accounted for 10% of cases, while individuals with high-normal blood pressure constituted 9% and isolated systolic hypertension 1%.

In Cameroon, Dzudie *et al.* also demonstrated a predominance of mild to moderate hypertension among hypertensive adults, reflecting a trend similar to that observed in our study [15].

These results are generally consistent with the literature, which describes glycosuria as a common marker [6] [17] of hyperglycemia exceeding the renal threshold. Proteinuria is generally associated with early-stage renal damage in diabetic patients [18], whereas ketonuria is primarily observed during severe acute decompensations such as diabetic ketoacidosis [19].

The vast majority of patients (91.7%) had type 2 diabetes, while type 1 diabetes accounted for only 8.3% of cases. This distribution reflects the typical prevalence of diabetes types in the adult population, with type 2 diabetes being overwhelmingly dominant among adults and the elderly, often associated with cardiovascular and metabolic risk factors.

The complications observed in diabetic patients were diverse and primarily affected the neurological, cardiovascular, and renal systems. Strokes were the most common (14.0%), followed by renal failure (12.0%) and heart failure (11.0%).

The presence of neuropathy (10.0%) and retinopathy (7.0%) reflects the long-term impact of diabetes on target organs.

Urinalysis was not performed in 58.3% of patients at admission, which limits the initial assessment of metabolic and renal complications of diabetes.

Among the patients tested, glycosuria was the most common finding (19.5%), followed by the combination of glycosuria and proteinuria (12.7%) and glycosuria, ketonuria, and proteinuria (6.0%). Cases of isolated or combined ketonuria were rare (2.5%), while isolated proteinuria was exceptional (1.0%).

Metformin was the most commonly used antidiabetic agent (64.6%), which is consistent with international recommendations for the initial treatment of type 2

diabetes, due to its efficacy, safety profile, and affordability [20] [21].

Sulfonylureas such as gliclazide (Diamicron®) remain widely used, particularly in resource-limited settings, due to their efficacy and relatively low cost. However, they should be used with caution because of the risk of hypoglycemia and weight gain [22].

The mixed or basal insulin analogs (Novomix, Mixtard, Lantus, Actrapid), are used less frequently is consistent with recommendations, which reserve insulin for situations of failure of oral antidiabetics, very high HbA1c, metabolic decompensation, or contraindications to oral antidiabetics [20] [23].

The most commonly used antihypertensive treatment was ACE inhibitors alone (35.6%), followed by combinations of ACE inhibitors and diuretics (11.4%) and ACE inhibitors and beta-blockers (9.8%). More complex combinations (triple and quadruple therapies) accounted for a smaller proportion ( $\leq 7.6\%$  each). ARB IIs were prescribed less frequently (5.3% for all combinations including them), while 22% of patients were receiving other diverse treatments.

In our study, angiotensin-converting enzyme (ACE) inhibitors were the most commonly used antihypertensive treatment (35.6%), either alone or in combination. This prevalence is consistent with international guidelines that list ACEIs among the first-line treatments for hypertension, particularly in patients with diabetes or kidney disease, due to their nephroprotective and cardioprotective effects [3] [24].

Thus, the observed treatment profile reflects both international recommendations and the structural constraints specific to the Guinean healthcare system, notably drug availability, cost, and access to care.

The majority of patients (60.6%) had a favorable outcome, indicating a good response to treatment and effective management. However, nearly one-third of patients (31.1%) developed complications, indicating that the disease or its comorbidities could pose significant health risks. The mortality rate was 8.3%, underscoring the potential severity of the condition under study and the importance of rigorous clinical monitoring.

#### 4. Conclusion

The comorbidity of hypertension and diabetes primarily affects middle-aged individuals, with a predominance of type 2 diabetes and serious complications such as stroke and kidney failure. Although therapeutic management has yielded favorable outcomes in a significant proportion of patients, mortality remains high. These findings underscore the importance of early screening, regular follow-up, and integrated care to reduce morbidity and mortality, as well as the need to establish a diabetes unit within the hospital.

#### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

## References

- [1] Kearney, P.M., Whelton, M., Reynolds, K., Muntner, P., Whelton, P.K. and He, J. (2005) Global Burden of Hypertension: Analysis of Worldwide Data. *The Lancet*, **365**, 217-223. [https://doi.org/10.1016/s0140-6736\(05\)17741-1](https://doi.org/10.1016/s0140-6736(05)17741-1)
- [2] World Health Organization (2022) Global Status Report on Noncommunicable Diseases 2022. WHO.
- [3] World Health Organization (2021) Hypertension. WHO. <https://www.who.int/news-room/fact-sheets/detail/hypertension>
- [4] International Diabetes Federation (2021) IDF Diabetes Atlas, 10th Edition. IDF.
- [5] Van Buren, P.N. and Toto, R. (2011) Hypertension in Diabetic Nephropathy: Epidemiology, Mechanisms, and Management. *Advances in Chronic Kidney Disease*, **18**, 28-41. <https://doi.org/10.1053/j.ackd.2010.10.003>
- [6] ElSayed, N.A., McCoy, R.G., Aleppo, G., Bajaj, M., Balapattabi, K., Beverly, E.A., et al. (2025) Introduction and Methodology: Standards of Care in Diabetes—2025. *Diabetes Care*, **48**, S1-S5. <https://doi.org/10.2337/dc25-sint>
- [7] Camara, A., Baldé, N.M., Diakité, M., Sylla, D., Baldé, E.H., Kengne, A.P., et al. (2016) High Prevalence, Low Awareness, Treatment and Control Rates of Hypertension in Guinea: Results from a Population-Based STEPS Survey. *Journal of Human Hypertension*, **30**, 237-244. <https://doi.org/10.1038/jhh.2015.92>
- [8] Diallo, M., Diallo, A., Balde, N., Camara, A., Bah, A., Bah, A., et al. (2014) P339 Profil épidémiologique, clinique et thérapeutique de 100 diabétiques suivis en ambulatoire au CHU de Conakry, en Guinée. *Diabetes & Metabolism*, **40**, A108. [https://doi.org/10.1016/s1262-3636\(14\)72630-8](https://doi.org/10.1016/s1262-3636(14)72630-8)
- [9] van Olmen, J., Schellevis, F., Van Damme, W., Kegels, G. and Rasschaert, F. (2012) Management of Chronic Diseases in Sub-Saharan Africa: Cross-Fertilisation between HIV/AIDS and Diabetes Care. *Journal of Tropical Medicine*, **2012**, Article ID: 349312. <https://doi.org/10.1155/2012/349312>
- [10] Njonou, S.R.S., Bangbang, C.F.G.E., Ouankou, C.N., Lekpa, F.K., Ngako, C.D., Mfeukeu-Kuate, L., et al. (2024) Prevalence and Determinants of Hypertension in a Semi-Urban Population: A Cross-Sectional Study in Dschang (West Region of Cameroon). *The Pan African Medical Journal*, **48**, Article 157. <https://doi.org/10.11604/pamj.2024.48.157.43781>
- [11] Iloh, G.U., Ikwudinma, A. and Obiegbu, N. (2013) Obesity and Its Cardio-Metabolic Co-Morbidities among Adult Nigerians in a Primary Care Clinic of a Tertiary Hospital in South-Eastern, Nigeria. *Journal of Family Medicine and Primary Care*, **2**, 20-26. <https://doi.org/10.4103/2249-4863.109936>
- [12] Basil, B., Mohammed, J.A. and Mba, I.N. (2025) Hypertension in Type 2 Diabetes Mellitus: Prevalence, Patterns, Determinants and Implications for Cardiovascular Risk Prediction in a Population of Nigerian Patients. *Cardiovascular Diabetology—Endocrinology Reports*, **11**, Article No. 23. <https://doi.org/10.1186/s40842-025-00225-9>
- [13] Bello-Ovosi, B.O., Asuke, S., Abdulrahman, S.O., Ibrahim, M.S., Ovosi, J.O., Ogun-sina, M.A., et al. (2018) Prevalence and Correlates of Hypertension and Diabetes Mellitus in an Urban Community in North-Western Nigeria. *Pan African Medical Journal*, **29**, Article 97. <https://doi.org/10.11604/pamj.2018.29.97.14191>
- [14] Ataklte, F., et al. (2015) Burden of Hypertension in sub-Saharan Africa: A Systematic Review. *BMC Cardiovascular Disorders*, **15**, Article No. 45.
- [15] Dzudie, A., Kengne, A.P., Muna, W.F.T., Ba, H., Menanga, A., Kouam Kouam, C., et al. (2012) Prevalence, Awareness, Treatment and Control of Hypertension in a Self-Selected Sub-Saharan African Urban Population: A Cross-Sectional Study. *BMJ Open*, **2**, e001217. <https://doi.org/10.1136/bmjopen-2012-001217>

- [16] Adejare, O.A. and Olugbake, O.A. (2023) Assessment of Drug Therapy Problems among Hypertensive and Diabetic Patients Attending Lagos Island General Hospital, Lagos, Nigeria. *West African Journal of Pharmacy*, **34**, 83-93. <https://doi.org/10.60787/wapcp-34-1-307>
- [17] Hall, J.E. (2021) Guyton and Hall Textbook of Medical Physiology. 14th Edition, Elsevier.
- [18] Taal, M.W., Chertow, G.M., Marsden, P.A., et al. (2020) Brenner & Rector's the Kidney. 11th Edition, Elsevier.
- [19] Mbanya, J.C.N., Motala, A.A., Sobngwi, E., Assah, F.K. and Enoru, S.T. (2010) Diabetes in Sub-Saharan Africa. *The Lancet*, **375**, 2254-2266. [https://doi.org/10.1016/s0140-6736\(10\)60550-8](https://doi.org/10.1016/s0140-6736(10)60550-8)
- [20] ElSayed, N.A., Aleppo, G., Bannuru, R.R., Beverly, E.A., Bruemmer, D., Collins, B.S., et al. (2024) Introduction and Methodology: Standards of Care in Diabetes—2024. *Diabetes Care*, **47**, S1-S4. <https://doi.org/10.2337/dc24-sint>
- [21] Davies, M.J., Aroda, V.R., Collins, B.S., Gabbay, R.A., Green, J., Maruthur, N.M., et al. (2022) Management of Hyperglycemia in Type 2 Diabetes, 2022. a Consensus Report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). *Diabetes Care*, **45**, 2753-2786. <https://doi.org/10.2337/dci22-0034>
- [22] Inzucchi, S.E., Bergenstal, R.M., Buse, J.B., Diamant, M., Ferrannini, E., Nauck, M., et al. (2015) Management of Hyperglycemia in Type 2 Diabetes, 2015: A Patient-Centered Approach: Update to a Position Statement of the American Diabetes Association and the European Association for the Study of Diabetes. *Diabetes Care*, **38**, 140-149. <https://doi.org/10.2337/dc14-2441>
- [23] Unger, T., Borghi, C., Charchar, F., Khan, N.A., Poulter, N.R., Prabhakaran, D., et al. (2020) 2020 International Society of Hypertension Global Hypertension Practice Guidelines. *Hypertension*, **75**, 1334-1357. <https://doi.org/10.1161/hypertensionaha.120.15026>
- [24] Byrne, R.A., Rossello, X., Coughlan, J.J., Barbato, E., Berry, C., Chieffo, A., et al. (2023) 2023 ESC Guidelines for the Management of Acute Coronary Syndromes. *European Heart Journal*, **44**, 3720-3826. <https://doi.org/10.1093/eurheartj/ehad191>