

# Emergency Hemodialysis at the Fousseyni Daou Hospital in Kayes, Mali

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## Abstract

**Introduction:** Emergency hemodialysis (EH) is a frequent occurrence in sub-Saharan Africa and is associated with high mortality. The aim of this study was to describe the epidemio-clinical profile of emergency hemodialysis patients at the Fousseyni Daou Hospital in Kayes, Mali. **Methodology:** This was a descriptive study with retrospective data collection carried out on patients undergoing emergency hemodialysis for the first time at the hemodialysis unit of the Kayes Hospital from July 24, 2023 to July 24, 2024. **Results:** During the study period, 110 patients underwent emergency hemodialysis, with a mean age of  $44.63 \pm 18.02$  years. Females accounted for 54.5%. A history of high blood pressure (HBP) was found in 71.8% of cases. Functional signs were dominated by physical asthenia and vomiting in 92.7% and 83.6% of cases respectively. On physical assessment, 21.8% of patients showed pericardial friction on auscultation. Eighty-nine patients (80.9%) were in chronic kidney disease (CKD) versus 21 cases (19.1%) of severe acute kidney injury (AKI) KDIGO stage 3. Patients had a mean hemoglobin level of  $7.08 \pm 2.01$  g/dl. Initial nephropathy in CKD patients was dominated by malignant hypertension in 38 cases (42.7%). Urgent indications for hemodialysis were uremic syndrome with encephalopathy or coma (70%), anuria lasting more than 48 hours with severe renal failure (11.8%), acute lung edema (7.1%), uremic pericarditis

(6.4%) and severe hyperkalemia (4.5%). The outcome was favorable in 71 patients (64.3%) versus 24 cases of death (21.8%) and 15 cases of abandonment of care against medical advice (13.6%). We noted total recovery of renal function in 16 patients (14.5%) out of 21 with AKI, versus 4 cases (3.6%) of partial recovery. The risk of mortality was mainly associated with uraemic coma and severe azotemia (urea > 30 mmol/l) at the time of dialysis initiation ( $P < 0.05$ ). **Conclusion:** Emergency hemodialysis is a frequent situation associated with high mortality at Kayes Hospital. Promoting the geographical accessibility of hemodialysis and ensuring its management is the key to better patient survival.

## Keywords

Renal Failure, Emergency Hemodialysis, Fousseyni Daou Hospital in Kayes

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## 1. Introduction

Chronic kidney disease (CKD) has become a public health problem worldwide, particularly in Sub-Saharan Africa, due to its increasing frequency [1]. In recent decades, the number of people on dialysis has been estimated at 2.6 million worldwide, and statistics suggest that the number will double by 2030 [2].

The frequency and lethality of emergency hemodialysis (EH) vary widely from country to country. According to data from an American meta-analysis, undocumented immigrants with end-stage renal disease treated with emergency hemodialysis have a higher 3-year mortality rate than patients who received standard hemodialysis [3]. In Madagascar, the frequency of EH was 41.93% at Joseph Raseta Befelatanana Hospital, with a mortality rate of 23.08% [4].

In Mali's capital, out of 62 EH performed at the Point G University Hospital in 2020, the case fatality rate was 69.35% [5]. The low socio-economic level in our context has a major impact on the regular follow-up of nephrology patients, who generally reach the advanced stages of CKD complications [6] [7]. As a result, hemodialysis (HD) carried out on an emergency basis, *i.e.*, immediately or within the first 48 hours, in the face of a life-threatening situation, is responsible for a high morbi-mortality rate, with a deterioration in quality of life, longer hospital stays and increased cost of care [8] [9].

To date, no data are available on EH in a regional health facility in Mali, hence the initiative to carry out this study, which aims to describe the epidemioclinical profile of emergency hemodialysis patients at the Fousseyni Daou Hospital in Kayes, Mali.

## 2. Methodology

### 2.1. Type and Period of Study

This was a descriptive study with retrospective data collection carried out at the

haemodialysis unit of Kayes Hospital from July 24, 2023 to July 24, 2024.

## 2.2. Sampling

The study population consisted of all hemodialysis patients in the unit during the study period, regardless of race or age.

For a frequency of emergency dialysis of 61%, and assuming a confidence level of 95% and a margin of error of 5%, the sample size should be  $n = 1.96^2 \times 0.61 \times 0.6/0.05^2 = 562.4$ , *i.e.*, approximately 562 patients.

## 2.3. Inclusion Criteria

All patients undergoing hemodialysis for the first time in an emergency situation with acute kidney injury (AKI) or chronic kidney disease (CKD) and a complete medical record were included.

## 2.4. Non-Inclusion Criteria

Not included were cases of scheduled dialysis without immediate vital urgency, and patients with incomplete records.

## 3. Data Collection

Data were collected from patients' individual medical records (consultation register, hospitalization record, dialysis record). Using the medical records, data were collected on an individual survey form including:

- Socio-demographic data included age, gender, socio-economic level (group I = senior government and/or private sector executives and import-export traders, group II = government and/or private sector employees and medium-sized traders, group III = manual workers, peasants, retail traders, and casual urban workers, provenances), insurance coverage or not. Group III represented patients with low socio-economic status.

- The clinical data sought were gastrointestinal symptoms (hiccups, anorexia, nausea, vomiting, gastrointestinal haemorrhage, constipation, diarrhoea), cardiovascular symptoms (hypertension, congestive heart failure, pericarditis, acute pulmonary oedema, cardiac arrhythmia, cardiomyopathy, accelerated atherosclerosis), respiratory symptoms (Kusmaul respiration, bronchopneumopathy, pleurisy), urinary symptoms (increased or decreased frequency of micturition, nocturia), skin symptoms (palpebral edema, facial puffiness, peripheral edema, pallor, pruritus, scratch lesions), neuromuscular symptoms (headache, sleep disorders, confusion, temporo-spatial disorientation, muscle weakness, myoclonus, cramps, convulsions, coma) and symptoms of mineral-bone disorders (bone pain, bone fractures).

- The risk factors investigated were classic (tobacco, alcohol, drugs, obesity, sedentary lifestyle, hypertension, diabetes, dyslipidemia) and specific to CKD (fluid retention, phosphocalcic disorders, anemia, left ventricular hypertrophy, homocysteinemia, arteriovenous fistula).

- Biological tests included blood tests (hemogram, urea, creatinemia, uric acid, ionogram, phosphocalcic balance, martial balance, lipid balance, vitamin balance, albuminemia, protidemia, transaminases and infectious diseases), urine tests (urine cytobacteriological study, 24-hour proteinuria, urine ionogram). The standards used were those of the Kayes region laboratories. In the absence of gasometry, severe metabolic acidosis was clinically evoked by the presence of Küssmaul respiration with free lungs on auscultation.

- Renal ultrasound was used to assess size, cortico-medullary differentiation and the presence or absence of kidney dilatation.

- Signs of acute pulmonary oedema (APO), pleurisy, cardiomegaly and pulmonary infection were detected by chest radiography.

- Electrocardiogram (ECG) and echocardiography were used to detect various cardiac abnormalities.

- The fundus was examined for signs of hypertensive and/or diabetic retinopathy.

- Data on vascular access included type of approach and time between catheter insertion and removal.

- The absence of renal biopsy, the etiology of renal failure was based on available clinical and paraclinical arguments.

- Patients' progress within 30 days of the first dialysis session was assessed. We chose this duration because of the higher mortality during the first month of dialysis [4] [9]. It included lethality, total recovery of renal function in HD, partial recovery of renal function in HD and maintenance in chronic HD.

### 3.1. Definition Criteria

- Emergency hemodialysis was defined in a patient as “the very first HD session occurring immediately within 24 hours of a nephrological evaluation, due to a risk deemed vital, consecutive to threatening hyperhydration, hyperkalemia, acidosis, poorly tolerated anemia, pericarditis or uremic confusion” [2].

HD was classically indicated as an emergency treatment for:

- Severe hyperkalemia  $\geq 7.5$  mmol/l refractory to drug measures according to ECG.

- Clinical metabolic acidosis with inadequate ventilatory compensation, with no margin for correction by bicarbonate in the event of hypervolemia.

- PAO refractory to diuretic treatment.

- Uremic syndrome with encephalopathy (asterixis, confusion or coma) or pericardial friction [10].

• The chronic nature of renal failure was evoked in the presence of anamnestic criteria (history of elevated creatinine levels, known general illness), morphological criteria (decrease in kidney size on renal ultrasound) and/or biological criteria (hypercreatininemia with glomerular filtration rate  $<60$  ml/min, normochromic normocytic anemia, hypocalcemia). CKD was classified into 5 stages according to the KDIGO “Kidney Disease Improving Global Outcomes” classification. The racially-calibrated Modification of Diet in Renal Disease (MDRD) equation was

used to estimate glomerular filtration rate (GFR) [11].

- Diuresis volume abnormalities were defined as anuria (diuresis less than 100 ml/24 h), oliguria (diuresis less than 400 ml/24 h), and polyuria (diuresis greater than 3 l/24 h) [11].

- Anemia was defined by a hemoglobin level < 12 g/dl, and considered severe for a hemoglobin level < 8 g/dl. It was regenerative when the reticulocyte count was > 120 Giga/l [11] [12].

### 3.2. Data Entry and Analysis

Data were analyzed using SPSS 20 French version and R studio software. Writing was done on Word 2016.

Quantitative variables were presented as averages, and qualitative variables as frequencies and percentages. Complete case (or available case) analysis was used in the case of missing data.

The statistical test used was Pearson's Chi-square, with a *P* value less than or equal to 0.05 considered significant. The association between the variable and mortality risk was assessed by odds ratio with 95% confidence interval, using a logistic regression model.

### 3.3. Ethical Considerations

The study complied with the ethical standards of our institution's research committee. Each patient and/or family was informed of the objectives of the study, the use of data for research purposes and the anonymity of the data collected. Informed consent was obtained.

## 4. Results

**Table 1.** Patient socio-demographic data (N = 110).

Socio-demographic data	Number	Percentage
Gender		
Male	50	45.5
Female	60	54.5
Age range (years)		
3 - 20	9	8.2
21 - 40	39	35.5
41 - 60	42	38.2
>60	20	18.2
Socio-economic level		
Low	95	86.4
Medium	14	12.7
High	1	0.9
Insurance		
Yes	15	13.6
No	95	86.4

Mean age: 44.63 ± 18.02 years, extremes: 3 and 88 years.

During the study period, out of 178 hemodialysis patients, 110 underwent dialysis in an emergency setting, representing a prevalence of 61.79%.

The mean age of patients was  $44.63 \pm 18.02$  years, with extremes of 3 and 88 years. Females accounted for 54.5% (60 cases). Hypercreatininemia was the main reason for hospitalization, accounting for 98.2% (108 cases), with a mean admission value of  $1846.2 \mu\text{mol/l}$  and extremes of 461 and  $3300 \mu\text{mol/l}$ . One patient out of two came from the emergency department of the facility. 86.4% of patients were uninsured and of low socio-economic status (**Table 1**).

A history of hypertension was found in 71.8% (79 cases), with irregular follow-up in 94.9% of patients and a mean duration of hypertension of  $4.89 \pm 4.65$  years. Patients were known diabetics in 10.9% (12 cases). Functional signs were dominated by physical asthenia, vomiting, anorexia and nausea in 92.7%, 83.6%, 80.9% and 67.3% respectively. At physical assessment, 56.4% of patients were suffering from fluid retention, compared with 16.4% from dehydration. Twenty-four patients (21.8%) had pericardial friction on cardiac auscultation (**Table 2**).

**Table 2.** Clinical data.

Clinical data	Number	Percentage
Antecedents		
Hypertension	79	71.8
Diabetes	6	5.5
Functional signs		
Asthenia	102	92.7
Vomiting	92	83.6
Anorexia	89	80.9
Nausea	74	67.3
Vertigo	64	58.2
Effort dyspnea	49	44.5
Physical signs		
Conjunctival pallor	98	89.1
Heart murmur	57	58.1
Pulmonary crackling	52	47.3
Edema of lower limbs	62	56.4
Pericardial friction	24	21.8
Dehydratation	18	16.4

The blood pressure profile according to the WHO classification revealed grade 3 hypertension in 26.4% of patients, and Grades 2 and 1 in 30.9% and 20% of cases respectively.

Eighty-nine patients (80.9%) were in chronic end-stage renal failure versus 21

cases (19.1%) of severe acute renal failure, KDIGO stage 3. Patients had a mean hemoglobin level of  $7.08 \pm 2.01$  g/dl, including 57.3% (63 patients) with a hemoglobin level below 8 g/dl (**Table 3**). Blood ionograms showed hypocalcemia, hyponatremia and hyperkalemia in 39.1%, 30% and 62.7% of cases respectively.

**Table 3.** Patients' biological data.

Biology	Mean $\pm$ Ecartype	Extremes
Hemoglobin (g/dl)	$7.08 \pm 2.00$	3 to 14
Serum creatinine ( $\mu\text{mol/l}$ )	$1819.53 \pm 784.7$	461 to 4087
Serum azotemia (mmol/l)	$38.7 \pm 13.12$	15 to 98
Uricemia ( $\mu\text{mol/l}$ )	$661.61 \pm 137.2$	389 to 1223
Natremia (mmol/l)	$134.7 \pm 7176$	113 to 156
Kalemia (mmol/l)	$5.74 \pm 12.63$	2 to 7.1
Calcemia (mmol/l)	$1.98 \pm 0.389$	1 to 3
Phosphoremia (mmol/l)	$1.77 \pm 0.550$	1 to 4.1
Vitamin D (N = 74)	$27.52 \pm 12.90$	8 to 61
Parathormone (N = 74)	$1031.50 \pm 870.62$	31 to 4561

**Table 4.** Initial kidney disease.

	Initial Kidney Disease	Number (%)
CKD (N = 89)	Malignant hypertension	38 (42.7)
	Chronic glomerulonephritis	21 (23.6)
	Chronic interstitial nephritis	17 (19.1)
	Hypertensive nephropathy (benign nephro-angiosclerosis)	7 (7.9)
	Diabetic nephropathy	4 (4.5)
	Nephropathy indeterminate	2 (2.2)
	AKI (N = 21)	Acute tubular necrosis
	Acute interstitial nephritis	4 (19)
	Acute rhabdomyolysis	2 (9.6)
	Acute obstructive uropathy	1 (4.7)
	Hemolytic uremic syndrome	1(4.7)

CKD: chronic kidney disease; AKI: acute kidney injury.

Hyperparathyroidism and hypovitaminosis D were found in 64.9% and 85.1% of cases (N = 74). Proteinuria was minimal in 91% of cases. Urinary tract infection was found in 57.2% of patients (N = 92), with *Escherichia coli* predominating in 45.3% of cases.

Among hypertensive patients who had a fundus examination (N = 70), 42.9% (30 cases) had a normal fundus. Hypertensive retinopathy was stage 2 in 31.4% of

cases, stage 3 and 1 in 12.9% and 11.1% respectively. Diabetic retinopathy was noted in 4 cases (3.6%). Left ventricular hypertrophy was found on ECG (N = 67) in 34 patients (50.7%).

The initial nephropathy of CKD patients (N = 89) was, in order of frequency, malignant nephroangiosclerosis (malignant hypertension) 38 cases (42.7%), chronic glomerulonephritis 21 cases (23.6%), chronic interstitial nephritis 17 cases (19.1%), benign nephroangiosclerosis 7 cases (7.9%), diabetic nephropathy 4 cases (4.5%), and undetermined nephropathy 2 cases (2.2%). The etiologies of organic AKI cases (N = 21) included 13 cases of acute tubular necrosis (62%), 4 cases of acute interstitial nephritis (19%), 2 cases of acute rhabdomyolysis (9.6%), 1 case of acute obstructive uropathy (2.2%) and 1 case of hemolytic uremic syndrome (2.2%) (**Table 4**).

Urgent indications for hemodialysis were uremic syndrome with encephalopathy or coma (70%), anuria lasting more than 48 hours with severe renal failure (11.8%), acute lung edema (7.3%), uremic pericarditis (6.4%) and severe hyperkalemia (4.5%). The right femoral catheter was the most commonly used vascular approach (87.3%). Native AVF was used in 3 patients (2.7%) (**Table 5**).

**Table 5.** Hemodialysis initiation conditions.

Hemodialysis Initiation Conditions		Number (%)
Vascular access	Right femoral catheter	96 (87.3)
	Left femoral catheter	9 (8.2)
	Right jugular catheter	2 (1.8)
	Native fistula	3 (2.7)
Urgent dialysis indications	Uremic syndrome	45 (40.9)
	Encephalopathy/Uremic coma	32 (29.1)
	Anuria	13 (11.8)
	Pulmonary acute edema	8 (7.3)
	Uremic pericarditis	7 (6.4)
	Hyperkalemia	5 (4.5)

**Table 6.** Patient outcomes.

Outcomes	Number	Percentage
Chronic dialysis	47	42.7
Dialysis cessation (total recovery of renal function)	16	14.5
Temporary cessation of dialysis (partial recovery of renal function)	4	3.6
Dialysis stopped against medical advice	15	13.6
Died	22	20.0
Transferred to other dialysis centers	6	5.5
Total	110	100.0

The overall outcome was favorable in 71 patients (64.5%), compared with 24 cases of death (21.8%) and 15 cases (13.6%) of abandonment of care against medical advice. Deaths occurred in a clinical context of deep coma (6 cases), septic shock (5 cases), ischemic stroke (5 cases), hemorrhagic stroke (2 cases), PAO (3 cases), pulmonary embolism (1 case) and 2 unspecified cases. Progression on dialysis was marked by total recovery of renal function in 16 patients (14.5%) out of 21 in acute renal failure versus 4 cases (3.6%) of partial recovery, 47 patients (42.7%) were maintained on chronic HD and 6 patients (5.5%) transferred to another center (Table 6).

There was a statistically positive relationship between uraemic coma and the occurrence of patient death [ $Chi-square = 13.750$   $ddl = 1$   $P = 0.0002$ ] (Table 7).

**Table 7.** Relationship between uraemic coma and patient death.

		Death		P
		Yes	No	
Uremic coma	Yes	10 (50.0%)	10 (50.0%)	0.0002
	No	12 (13.3%)	78 (86.7%)	

## 5. Discussion

During the study period, of 178 hemodialysis patients, 110 were dialyzed in an emergency setting, a prevalence of 61.79%. In the literature, the prevalence of EH varies between 40% and 60% [9] [13]. This variation in frequency is explained by the absence of a clear consensus on the variability of the definition of EH, which changes from one study to another.

This high proportion of EH in sub-Saharan Africa bears witness to the delay in consultation and management of pathologies that can lead to renal failure, but also to the increasing incidence of these pathologies [14] [15].

Emergency hemodialysis patients were young, with a mean age of  $44.63 \pm 18.02$  years, compared with 36.82 years at the Point G hospital reported by Traoré AK et al. in 2020 [5]. Our results are similar to data recently reported from Tunisia and Senegal, with mean ages of 58 years ( $\pm 4$ ) and 46.39 years ( $\pm 17.13$ ) respectively [16] [17]. The difference with Western countries is explained by the ageing of the population and the greater accessibility of care for the elderly in industrialized countries. Numerous studies show the predominance of men in chronic kidney disease [13] [18]. The predominance of women in this study could be explained by the high level of male immigration to the Kayes region.

The predominance of CKD, similar to other studies, and the absence of a permanent vascular approach may be explained by the late referral of patients with CKD to nephrologists, coupled with possible denial of management or abandonment of follow-up in our low socio-economic context [6] [7] [17]. On the whole, before their first nephrological consultation in Kayes, patients had already transited through one or two health care districts, where creatinine dosage is often not

given priority over general pathologies such as hypertension and diabetes [19]. Indeed, early referral to nephrologists of patients in stage 3/4 of CKD reduces the prevalence of EH and lowers the mortality rate after initiation of dialysis [20] [21].

This early recourse prepares them for dialysis by sparing the venous capital and creating permanent vascular access, notably the arteriovenous fistula.

Hypertension and diabetes were the main pathologies reported. In our study, they were encountered in 71.8% and 10.9% of cases respectively. In the studies by Traoré AK *et al.* and Brown *et al.* emergency dialysis patients were hypertensive in 77.4% and 93% of cases respectively [5] [22]. According to the literature, 28% to 46% of patients were diabetic [23]. These data further confirm the epidemiological transition through the emergence of chronic non-communicable pathologies.

Our study also revealed the predominance of malignant hypertension among the etiologies of CKD. These results reflected the lack of proper follow-up of hypertensive patients. In the earlier Malian study by Traoré AK *et al.* in 2020, chronic glomerulonephritis was the main cause of CKD, followed by hypertension [5]. According to data from several studies, hypertension remains the most frequent etiology of chronic kidney disease in Kayes [19] [24].

On admission, the mean hemoglobin level was 7.08 g/dl, compared with between 9.5 and 10.6 g/dl in studies [4] [18] [24].

In EH indications, the majority of patients were in the poor general condition of uremic syndrome with encephalopathy or coma, in contrast to other studies where hyperkalemia and clinical metabolic acidosis represented the main indications [4] [25]. This difference may be explained by late referral on the one hand, and the low socio-economic status of patients on the other.

Our short-term case fatality rate was 21.8% versus 69.35% and 23.08% reported by Traoré AK *et al.* [5] and Randrianarisoa RMF *et al.* [4]. These rates are high compared with the Senegalese study with a rate of 17.8% [17]. The difference could be explained by the fact that 4.6% of their patients had permanent vascular access, whereas 97.3% of patients in our study were dialyzed using a catheter. The use of central venous catheters entails infectious and cardiovascular risks. Observations have shown that the survival of patients dialyzed in a planned manner using an AVF is better than that of patients dialyzed urgently on a catheter [20] [21].

**Table 8.** Potential factors associated with the risk of patient death according to the logistic regression model.

	Estimate Std	Z value	Pr (> Z )	relative risk
Severe anemia	-0.3703	-0.598	0.5498	0.690
Severe azotemia	1.8728	2.008	0.0446	6.506
Pericarditis	1.4333	1.719	0.0855	4.192
Uremic coma	2.3619	3.688	0.0002	10.611

Some potential factors linked to the risk of death were evaluated in our patients at the time of dialysis initiation. In a multivariate analysis using a logistic regression model, uraemic coma increased the risk of death by a factor of 10, and by a factor of 6 for serum azotemia > 30 mmol/l (**Table 8**). In Burkina Faso in 2021, Ilboudo CS *et al.* [26], also noted that an altered state of consciousness before the hemodialysis session was associated with the risk of death ( $P = 0.02$ ).

Aside from the complications of end-stage CKD, patients' low socio-economic status was an important factor in increasing their risk of mortality. This finding is supported by data from an American meta-analysis among undocumented immigrants showing that 3-year mortality was higher with hemodialysis versus standard hemodialysis [3].

Our study, although innovative in a region of Mali, had certain shortcomings. Our study and follow-up periods were relatively short compared with studies in the literature. This may underestimate the prevalence of EH and the mortality rate. Further work is needed to determine the long-term fate of emergency hemodialysis patients. The predominance of CKD and the absence of pre-existing permanent vascular access demonstrate our difficulty in following good medical practice recommendations. More frequent monitoring of glomerular filtration rate is needed to enable earlier recognition of rapidly progressing renal disease.

Apart from the difficulty of following recommendations, the management of CKD in Mali faces other problems. Kidney transplants can only be performed abroad. Although hemodialysis is free of charge, complementary examinations and parallel care are the patient's responsibility, and are often not honored for financial reasons. Other problems arise from the lack of equipment in hospitals. The majority of care services for chronic kidney disease are concentrated in the capital, penalizing the majority of the Malian population.

## 6. Conclusion

This study highlighted the fact that emergency dialysis patients were unprepared for dialysis and arrived in a serious condition. Mortality was high in the first month, and prognosis was influenced by their condition on admission. Efforts must be made to increase the proportion of patients undergoing dialysis in a planned manner, with mass education, promotion of geographical accessibility of hemodialysis and insurance coverage for the proper management of patients with kidney disease.

## Key Words

Emergency Hemodialysis, Kayes, Mali.

## Conflicts of Interest

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

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## Appendix

### Survey form:

Full name: \_\_\_\_\_

Socio-demographic data:

Age: /##/

Sex: /#/

Service of origin: /#/ 1 = Emergency 2 = City clinic 3 = Other: \_\_\_\_\_

MDC: /#/ 1 = Hypercreat 2 = Renal insufficiency on echo 3 = Other: \_\_\_\_\_

ATCD:

HTA: /#/ 1 = Yes 2 = No

Diabetes: /#/ 1 = Yes 2 = No

Symptoms:

Asthenia: /#/ 1 = Yes 2 = No

Headache: /#/ 1 = Yes 2 = no

Tinnitus: /#/ 1 = Yes 2 = no

Phosphene: /#/ 1 = Yes 2 = no

Vertigo: /#/ 1 = Yes 2 = no

Exertional dyspnea: /#/ 1 = Yes 2 = no

Anorexia: /#/ 1 = Yes 2 = no

Nausea: /#/ 1 = Yes 2 = no

Vomiting: /#/ 1 = Yes 2 = no

Clinical parameters on admission:

PAD/###/NOT/###/

If hypertension WHO grade: \_\_\_\_\_

Mucocutaneous pallor: /#/ 1 = Yes 2 = no

Heart murmurs: /#/ 1 = Yes 2 = No

Crackles: /#/ 1 = Yes 2 = No

Pericardial friction: /#/ 1 = Yes 2 = No

IMO: /#/ 1 = Yes 2 = No

Ascites: /#/ 1 = Yes 2 = No

Dehydration folds: /#/ 1 = Yes 2 = No

Uremic frostbite : /#/ 1 = Yes 2 = No

Uremic encephalopathy: /#/ 1 = Yes 2 = No

Uremic comma: /#/ 1 = Yes 2 = No

Diuresis: /#/ 1 = oliguria less than 500 ml/24 H 2 = diuresis anuria less than 100 ml/24 H 3 = Preserved diuresis

Complementary tests on admission:

Hb: /#/ 1 = high 2 = normal 3 = diminished Val \_\_\_\_\_

Créat: /#/ 1 = high 2 = normal 3 = diminished Val \_\_\_\_\_

Urea: /#/ 1 = high 2 = normal 3 = diminished Val \_\_\_\_\_

Uric acid: /#/ 1 = high 2 = normal 3 = diminished Val \_\_\_\_\_

Natraemia: /#/ 1 = high 2 = normal 3 = diminished Val \_\_\_\_\_

Kalemia: /#/ 1 = high 2 = normal 3 = diminished Val \_\_\_\_\_

Calcemia: /#/ 1 = high 2 = normal 3 = diminished Val \_\_\_\_\_  
Phosphorus: /#/ 1 = high 2 = normal 3 = diminished Val \_\_\_\_\_  
VitD: /#/ 1 = high 2 = normal 3 = diminished Val \_\_\_\_\_  
24 H proteinuria (g/24 H): /#/ 1 = minimal (less than 1 g/24 H) 2 = medium (1 – 3 g/24 H) 3 = massive (more than 3 g/24 H)  
Cytobacteriological study of urine:  
Leukocyturia (10000/ml): /#/ 1 = yes 2 = no  
Hematuria (10/mm 3): /#/ 1 = yes 2 = no  
Urinary tract infection: /#/ 1 = yes 2 = no If yes germ \_\_\_\_\_  
Renal ultrasound:  
Kidney size: /#/ 1 = normal (100 - 130) 2 = diminished (inf 100) 3 = increased (sup 130)  
Differentiation: /#/ 1 = good 2 = poor  
Other to specify: \_\_\_\_\_  
Fundus: /#/ 1 = normal 2 = RH stage1 3 = RH stage2 4 = RH stage3 5 = RD  
LVH (ECG): /#/ 1 = Yes 2 = No  
Type of IR: /#/ 1 = IRA 2 = IRC  
CKD Initial kidney disease: /#/ \_\_\_\_\_  
AKI Initial kidney disease: /#/ \_\_\_\_\_  
Indication for dialysis: /#/ 1 = Uremic syndrome 2 = Pericardial friction 3 = Anuria longer than 48 H 4 = Hyperkalemia 5 = OAP 6 = Metabolic acidosis 7 = Refractory fluid retention 8 = Uremic encephalopathy 9 = Uremic coma  
Vascular approach: /#/ 1 = KTFD 2 = KTFG 3 = KJD 4 = KTJD  
General evolution: /#/ 1 = favorable 2 = deceased 3 = stopped against medical advice  
Progress on dialysis: /#/ 1 = Chronic dialysis 2 = HD withdrawal 3 = Temporary withdrawal