

ORIGINAL ARTICLE

The workload of the Interventional Cardiology Centers from Romania: a 2018 overview and 2014-2018 trends

 Lucian Predescu¹, Marin Postu¹

Abstract: This article summarizes the workload of the interventional cardiology centers from Romania during 2018. Data was collected from all interventional cardiology centers from Romania using a standard reporting model. The report highlights the total number of coronary interventions, peripheral interventions and other procedures like TAVI and interventions in structural heart diseases, that were performed in 2018 in Romania. A comparison of the workload of the interventional cardiology centers from Romania between 2014 to 2018 was done.

Keywords: interventional cardiology, percutaneous coronary interventions, stents.

Rezumat: Acest articol sintetizează activitatea centrelor de cardiologie intervențională din România în anul 2018. Datele au fost colectate de la toate centrele de cardiologie intervențională din România, utilizând un model standard de raportare. Raportul evidențiază numărul total de intervenții coronariene, intervenții periferice și alte proceduri precum TAVI și intervenții în bolile cardiace structurale, care au fost efectuate în 2018 în România. A fost comparată activitatea centrelor de cardiologie intervențională din România între anii 2014 și 2018.

Cuvinte cheie: cardiologie intervențională, intervenții coronariene percutane, stenturi.

This article summarizes the workload of the interventional cardiology centers of Romania during 2018 and it highlights the trends in coronary or peripheral interventions between 2014 and 2018¹⁻⁴. Data was collected from all interventional cardiology centers from Romania using a standard reporting model at the initiative of the Interventional Cardiology Working Group of Romanian Society of Cardiology.

Table 1 summarizes the data from 2018 provided by 38 public and private interventional cardiology centers from Romania. Currently, there are 38 interventional cardiology centers in Romania, of which 15 are private centers and 23 public centers with 61 functional angiographs. In 2018, in Romania were 126 independent interventional cardiologists and 66 interventional cardiologists in training.

The annual number of PCIs in every interventional cardiology center from Romania is represented in Figure 1. A direct comparison of data from 2014 to 2018 was done, that highlights the continuous increase

of workload of the interventional cardiology centers from Romania (Figure 2). Between 2014 and 2015 there was a step increase in the number of PCIs performed annually, that flattened in 2017-2018. In 2018, in Romania, 21333 PCIs were performed.

The total number of primary PCIs performed in STEMI patients has a downward trend (Figure 3). This can raise some questions about how the STEMI program is financed and how the patients were reported.

There was a linear increase in the total number of implanted stents (Figure 4). Each year, the percentage of implanted drug eluting stents increased.

A constant progress was obtained in what concerns peripheral angioplasty. The total number of peripheral angioplasties performed had a step increased in 2017 and in 2018. In 2018 there was an increase with 14.2% compared to 2017 (Figure 5).

With the implementation of new program, the number of TAVI performed in 2018 almost doubled comparing to 2017.

¹ „Prof. Dr. C.C. Iliescu” Emergency Institute for Cardiovascular Diseases, Bucharest, Romania

▼ **Contact address:**

Marin Postu, MD

„Prof. Dr. C.C. Iliescu” Emergency Institute for Cardiovascular Diseases, Bucharest, Romania.

E-mail: marin_postu@yahoo.com

There is a continuous need of implementing a Mandatory Interventional Cardiology National Registry, capable of monitoring objectively these key health care services in a standard manner. This national registry can guide further development of the interventional cardiology in Romania.

Table 1. Reported data from all Interventional Cardiology Centers from Romania in 2018

City	Bucharest							
Hospital	„Prof. Dr. C.C. Iliescu” EICD	SUUB	Floreasca	Agrippa Ionescu	Military	Bagdasar	Elias	Sf. Ioan
Nr. Of Cathlabs	3	3	2	1	3	1	2	1
Nr. Independent operators	7	5	3	3	4	2	6	2
Nr. of in training operators	12	4	3	1	1	1	3	0
Coronary Interventions								
Coronarography	4361	1137	2220	1322	1558	790	712	671
Total nr. of PCI	1803	1105	1306	254	614	208	653	219
PCI without stents	124	47	25	4	19	7	48	34
PCI with stents	1679	1058	1281	250	596	201	605	185
STEMI	711	888	750	4	218	23	361	14
Stents per patient ¹	1.51	1.62	1.28	1.37	1.9	1.5	1.8	1.1
Total nr. of stents	2542	1710	1671	343	1133	303	814	241
Nr. of DES	2434	1704	1616	343	921	298	774	213
DES/stents ratio (%)	96%	99%	97%	100%	81%	98%	95%	88%
BVS	0	0	0	0	5	0	0	0
Cutting, Scoring	144	4	10	2	22	5	0	0
Rotablation	29	0	4	1	0	0	0	0
FFR/IFR	8	6	41	2	7	0	0	0
IVUS	9	4	15	1	7	0	0	0
OCT	0	7	31	3	0	0	0	4
Peripheral interventions								
Peripheral PTA ²	287	0	0	30	273	2	19	52
Renal PTA	10	0	0	1	27	1	0	14
Carotid PTA	20	0	0	22	32	0	3	0
Total nr. of stents in peripheral PTA	165	0	0	23	327	3	2	43
Peripheral angiography	649	44	0	360	618	184	54	257
Other interventions								
TAVI	85	15	0	7	12	0	0	0
MitraClip	0	0	0	0	0	0	0	0
Aortic endoprothesis	18	0	0	4	12	0	0	0
Interventions in structural heart disease ³	18	0	0	0	0	0	0	0

City	Bucharest				
Hospital	Sanador	Ares – Monza	Colentina	Medlife	CDT Victor Babes
Nr. Of Cathlabs	2	4	1	1	1
Nr. Independent operators	7	6	1	3	1
Nr. of in training operators	0	1	1	0	0
Coronary Interventions					
Coronarography	1215	1460	248	444	82
Total nr. of PCI	164	527	9	140	23
PCI without stents	0	0	0	11	0
PCI with stents	164	444	9	129	23
STEMI	7	0	0	5	0
Stents per patient ¹	1.8	2.1	1.44	1.38	1.7
Total nr. of stents	295	1158	13	194	40
Nr. of DES	295	1158	13	190	40

DES/stents ratio (%)	100%	100%	100%	98%	100%
BVS	0	0	0	0	0
Cutting, Scoring	0	7	0	5	0
Rotablation	2	15	0	0	0
FFR/IFR	0	0	0	0	0
IVUS	0	5	0	0	0
OCT	0	0	0	0	0
Peripheral interventions					
Peripheral PTA ²	45	70	2	30	4
Renal PTA	3	3	0	3	0
Carotid PTA	1	20	0	8	0
Total nr. of stents in peripheral PTA	10	40	1	52	2
Peripheral angiography	506	243	25	98	16
Other interventions					
TAVI	10	26	0	0	0
MitraClip	0	10	0	0	0
Aortic endoprosthesis	12	7	0	0	0
Interventions in structural heart disease ³	4	30	0	10	0

City	Cluj Napoca					Iași	
	Heart Institute, Cluj	SCJU Cluj	Cardioteam (January-October)	Ares-Monza (October-December)	Rehabilitation	ICVD, Iași	Arcadia
Nr. of Cathlabs	2	1	1	2	1	2	1
Nr. Independent operators	8	3	1	1	2	7	2
Nr. of in training operators	2	7	2	1	1	3	0
Coronary Interventions							
Coronarography	3380	1267	382	300	626	4882	735
Total nr. of PCI	1675	669	173	147	260	1753	106
PCI without stents	196	33	14	2	240	94	2
PCI with stents	1479	636	159	145	20	1659	104
STEMI	594	186	1	0	10	1060	0
Stents per patient ¹	1.41	1.73	1.43	1.46	1.4	1.25	1.3
Total nr. of stents	2367	1173	227	212	336	2207	135
Nr. of DES	1823	1087	227	210	300	1803	135
DES/stents ratio (%)	77%	93%	100%	99%	89%	81%	100%
BVS	0	0	4	2	0	0	0
Cutting, Scoring	14	0	12	0	0	15	0
Rotablation	14	0	0	0	0	0	0
FFR/IFR	10	0	0	0	0	0	0
IVUS	37	0	0	0	0	0	0
OCT	1	3	0	0	0	0	0
Peripheral interventions							
Peripheral PTA ²	134	112	32	36	40	204	5
Renal PTA	26	3	8	5	3	10	1
Carotid PTA	12	9	18	16	0	32	13
Total nr. of stents in peripheral PTA	128	58	66	62	10	109	0
Peripheral angiography	348	337	81	119	118	625	58
Other interventions							
TAVI	46	0	0	0	0	25	0
MitraClip	0	0	0	0	0	0	0
Aortic endoprosthesis	27	0	0	0	0	11	0
Interventions in structural heart disease ³	10	0	2	2	0	20	0

City Hospital	Târgu Mureș				Timișoara		Craiova
	ICVD, Tg Mures	Cardio Med	SCJU Tg Mures	Nova Vita	ICVD, Timisoara	Cordismed	County Hospital
Nr. of Cathlabs	2	1	2	1	2	1	1
Nr. independent operators	6	3	6	6	7	1	2
Nr. of in training operators	3	3	4	0	2	1	3
Coronary Interventions							
Coronarography	2072	346	309	1393	2850	875	342
Total nr. of PCI	1341	255	669	70	1636	155	52
PCI without stents	108	36	54	0	95	4	0
PCI with stents	1232	219	615	70	1541	151	52
STEMI	353	0	542	0	1014	12	1
Stents per patient ¹	1.44	1.3	1.5	1.24	1.78	1.77	
Total nr. of stents	1940	301	841	87	2755	248	
Nr. of DES	1925	270	300	87	1700	248	
DES/stents ratio (%)	99%	89%	35%	100%	61%	100%	
BVS	0	0	0	0	0	0	0
Cutting, Scoring	20	0	0	0	1	0	0
Rotablation	16	0	1	0	0	0	0
FFR/IFR	41	43	0	0	5	0	0
IVUS	0	42	7	0	0	0	0
OCT	33	46	41	0	5	0	0
Peripheral interventions							
Peripheral PTA ²	77	71	20	10	14	54	0
Renal PTA	10	0	2	0	2	0	0
Carotid PTA	32	1	0	0	30	12	0
Total nr. of stents in peripheral PTA	44	9	7	3	35	58	0
Peripheral angiography	369	11	52	126	600	75	0
Other interventions							
TAVI	11	0	0	0	6	0	0
MitraClip	0	0	0	0	0	0	0
Aortic endoprosthesis	9	0	0	0	6	0	0
Interventions in structural heart disease ³	25	0	0	0	10	0	0

City Hospital	Brasov		Oradea	Arad	Suceava
	Clinicco	County Hospital	County Hospital	Cardiolife	Med New Life
Nr. of Cathlabs	1	2	2	1	2
Nr. independent operators	2	3	4	1	2
Nr. of in training operators	2	0	0	1	0
Coronary Interventions					
Coronarography	1589	2243	1504	875	422
Total nr. of PCI	491	852	767	155	356
PCI without stents	14	197	21	4	21
PCI with stents	477	655	746	151	335
STEMI	4	435	370	12	329
Stents per patient ¹	1.41	1.3	1.9	1.77	1.19
Total nr. of stents	694	N/A	1463	248	425
Nr. of DES	689	1000	1218	248	115
DES/stents ratio (%)	95%	N/A	83%	100%	39%
BVS	0	0	0	0	0
Cutting, Scoring	2	20	0	0	0
Rotablation	20	0	0	0	0
FFR/IFR	0	40	0	0	0
IVUS	0	0	0	0	0
OCT	0	3	0	0	0
Peripheral Interventions					
Peripheral PTA ²	15	0	0	54	55
Renal PTA	4	0	0	0	0

Carotid PTA	1	10	0	12	7
Total nr. of stents in peripheral PTA	20	0	0	58	40
Peripheral angiography	13	0	146	75	24
Other Interventions					
TAVI	1	0	0	0	0
MitraClip	0	0	0	0	0
Aortic endoprosthesis	3	0	0	0	0
Interventions in structural heart disease ³	5	0	0	0	0

City	Baia Mare	Sibiu		Constanța	Ploiești	Pitești	Craiova
Hospital	County Hospital	Polisano	County Hospital	Ares - Monza	Ploiesti	Pitesti	County Hospital
Nr. of Cathlabs	2	1	1	1	2	1	1
Nr. independent operators	2	1	1	1	2	3	2
Nr. of in training operators	1	1	1	0	0	1	3
Coronary Interventions							
Coronarography	399	1006	737	1239	780	447	342
Total nr. of PCI	669	412	203	642	455	345	52
PCI without stents	35	22	5	37	23	24	0
PCI with stents	634	390	198	605	432	321	52
STEMI	354	40	20	269	189	57	1
Stents per patient ¹	1.47	1.52	1.39	1.2	1.04	1.18	1.42
Total nr. of stents	931	629	284	770	453	408	74
Nr. of DES	687	512	275	708	377	373	68
DES/stents ratio (%)	74%	81%	96%	90%	83%	92%	91%
BVS	0	0	0	0	0	0	0
Cutting, Scoring	0	35	0	0	0	7	0
Rotablation	2	0	0	0	0	0	0
FFR/IFR	10	20	0	0	0	5	0
IVUS	0	0	0	0	0	6	0
OCT	1	0	0	0	0	0	0
Peripheral Interventions							
Peripheral PTA ²	33	35	80	1	9	126	0
Renal PTA	0	0	0	1	0	2	0
Carotid PTA	0	0	0	0	0	1	0
Total nr. of stents in peripheral PTA	26	20	30	2	1	85	0
Peripheral angiography	141	36	194	0	164	379	36
Other Interventions							
TAVI	0	21	0	0	0	0	0
MitraClip	0	0	0	0	0	0	0
Aortic endoprosthesis	0	23	0	0	0	0	0
Interventions in structural heart disease ³	0	7	0	0	0	0	0

1. It will represent the ratio between the total number of implanted stents and the total number of patients undergoing PCI.

2. Number of peripheral angioplasty (lower and upper limbs artery, not including carotid arteries).

3. Interventions in cardiac structural diseases: percutaneous closures of DSA, DSV, PFO, arterial duct, balloon valvulotomies, left atrial appendage closure.

(PCI – percutaneous coronary intervention, STEMI – ST segment elevation myocardial infarction, DES – drug eluting stent, BVS – bioresorbable vascular scaffold, FFR - fractional flow reserve, IFR – instantaneous wave-free ratio, IVUS – intravascular ultrasound, OCT – optical coherence tomography, PTA – percutaneous transluminal angioplasty, TAVI – transcatheter aortic valve implantation).

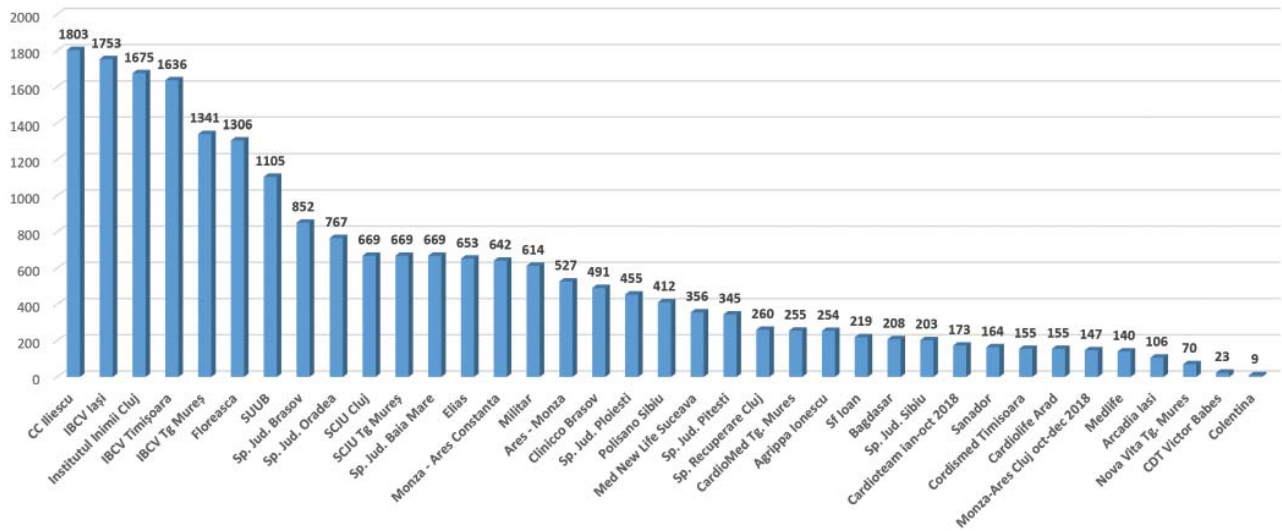


Figure 1. Total number of PCIs in 2018 in all interventional centers from Romania (PCI - percutaneous coronary intervention).

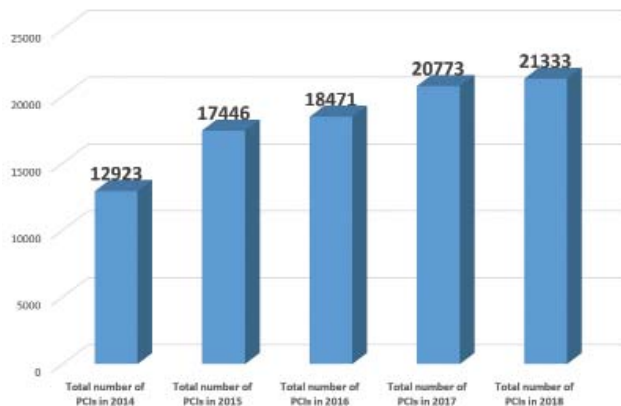


Figure 2. Total number of PCIs from 2014 to 2018 in Romania (PCI - percutaneous coronary intervention).

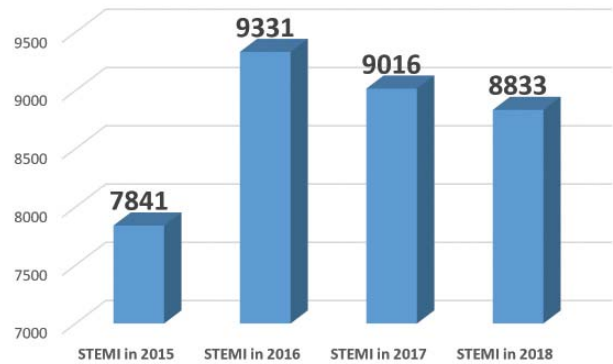


Figure 3. Total number of primary PCIs in STEMI patients from 2015 to 2018 in interventional centers from Romania (STEMI - ST segment elevation myocardial infarction).

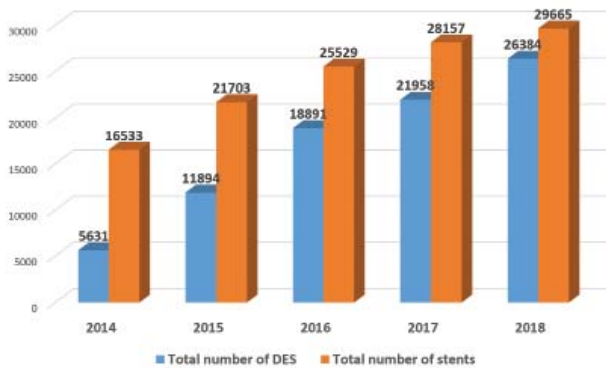


Figure 4. Total number of stents implanted from 2014 to 2018 in Romania.

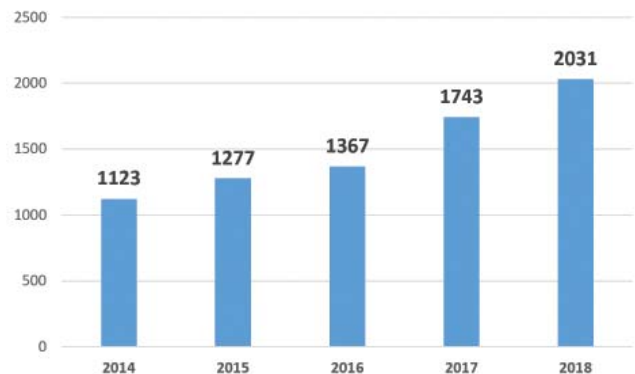


Figure 5. Total number of peripheral angioplasties from 2014 to 2018 in Romania (only in interventional cardiology centers).

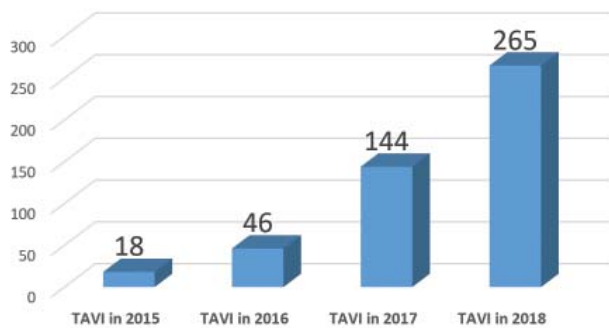


Figure 6. Total number of TAVI performed from 2014 to 2018 in Romania (TAVI - transcatheter aortic valve implantation).

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