

Contents

Author biography, xi

Preface – Direction to “Perfect 24-hour Blood Pressure Control”, xv

Acknowledgments, xix

1 Evidence and scientific rationale for ambulatory blood pressure monitoring (ABPM), 1

Diurnal BP variation and the concept of “perfect 24-hour BP control”, 1

Nocturnal hypertension and nocturnal BP dipping status, 3

Nocturnal BP dipping status, 3

Non-dipper patterns of BP and pulse rate, 3

Riser pattern of BP and cardiovascular disease risk, 4

Riser pattern and HF, 7

Riser pattern and brain damage, 15

Nocturnal hypertension, 17

Associated Conditions and Mechanisms of Nocturnal Hypertension, 20

Mechanism of cardiovascular risk of nocturnal hypertension, 22

Extreme dipping, 24

Morning surge in BP, 27

Definition of MBPS, 33

Morning BP surge and cardiovascular disease, 34

Morning BP surge and organ damage, 37

Determinants of MBPS, 43

Mechanism of morning risk, 44

Morning BP surge and hemostatic abnormalities, 46

Vascular mechanism of exaggerated morning BP surge, 49

BP Variability and systemic hemodynamic atherothrombotic syndrome (SHATS), 52

The resonance hypothesis of BP surge, 53

Orthostatic hypertension, 54

Ambulatory BP variability, 57

Visit-to-visit variability in office BP, 58

Vicious cycle between BP variability and vascular disease—SHATS, 59

White-coat and masked hypertension, 71
 White-coat hypertension, 73
 Masked hypertension, 75
Advances in ABPM, 75
 Development of information and communication technology-based
 multi-sensor (IMS)-ABPM, 75
 New ABPM indices, 77
 HI-JAMP registry, 82

2 Scientific rationale for HBPM, 85

Five prospective, general practitioner-based, home BP studies, 85
Morning hypertension, 85
 Control status of morning home BP in the J-HOP study, 88
 Evidence for morning hypertension control, 89
Home BP variability, 99
 Morning–evening difference (ME-dif), 99
 SD, CV, ARV, and VIM of home BP, 101
 Maximum home SBP, 103
 Orthostatic Home BP Change, 103
 Seasonal variation of home BP and “thermosensitive
 hypertension”, 109
 Alcohol, 113
Daytime hypertension (stress hypertension), 115
Nighttime HBPM, 115
 Cutting-edge of HBPM, 115
 Basic nighttime home BP monitoring (Medinote), 119
 Clinical evidence using nocturnal HBPM: J-HOP nocturnal BP study, 119
 Trigger nighttime BP monitoring, 127
 IT-based trigger nighttime BP monitoring system and the SPREAD
 study, 133
 CPAP adherence and nighttime BP surge, 135
 Antihypertensive medication on nighttime BP surge, 139
 Wrist home HBPM and WISDOM Night study, 145

3 Practical use of ABPM and HBPM, 147

Concept and positioning of ABPM and HBPM in guidelines, 147
 Recent guidelines, 147
 Diagnosis of masked and white-coat hypertension, 147
 Definition of morning hypertension, 148
 Definition of nocturnal hypertension, 150
 When to use HBPM and ABPM, 150

Clinically suspected SHATS,	152
Cardio-ankle vascular index (CAVI),	154
Coupling study,	154
How to measure home BP,	155
Nighttime home BP measurement schedule,	159
ABPM parameters,	162
24-hour BP,	166
Daytime BP and nighttime BP,	166
Morning BP parameters,	166
Nighttime BP parameters,	166
MBPS parameters,	166
Nighttime BP surge parameters,	166
Nighttime BP dipping parameters,	167
ABPM-defined hypertension subtypes,	167
Home and ambulatory BP-guided management of hypertension,	167
STEpwise-Personalized 24-hour BP control approach (STEP24 approach),	167
Targeting morning hypertension (Step 1),	167
Targeting nocturnal hypertension (Step 2),	171
Pressor mechanism-based nighttime BP management strategy,	173
4 BP targets, when to initiate antihypertensive therapy, and nonpharmacological treatment,	177
Clinical implications of antihypertensive treatment,	177
SPRINT and automated office BP,	177
Meta-analysis of antihypertensive trials,	177
When to initiate antihypertensive therapy,	178
Patient preference,	178
Sodium intake,	179
Other dietary requirements,	181
Exercise,	183
Sleep hygiene,	185
Housing condition,	185
Applications and algorithms to facilitate lifestyle modification: CureAPP,	187
5 Antihypertensive medication,	189
Concept of 24-hour BP lowering including nighttime and morning BPs,	189
Chronotherapy,	189
Antihypertensive drug choice,	190
Calcium channel blockers,	190
Amlodipine,	194
Nifedipine,	195

- Cilnidipine, 197
- Azelnidipine, 199
- Angiotensin-converting enzyme inhibitors, 201
- Angiotensin receptor blockers (ARBs), 201
 - Valsartan, 201
 - Telmisartan, 204
 - Candesartan, 204
 - Olmesartan, 205
 - Azilsartan, 206
- Diuretics, 212
- Alpha-adrenergic blockers and beta-adrenergic blockers, 214
- Mineralocorticoid receptor blockers (MRB), 215
- Angiotensin receptor-neprilysin inhibitor (ARNi), 217
- Endothelin receptor antagonists (ERA), 221
- Combination therapy, including single pill combinations, 222
 - First-line therapy, 222
 - Second-line therapy, 222
 - Clinical trials of antihypertensive combination therapy, 226
- Management of resistant hypertension, 238
 - Third-line therapy, 238
 - Fourth-line therapy, 239
- SGLT2 inhibitors, 240
 - SACRA study, 243
 - SHIFT-J study, 244
 - LUSCAR study, 248
 - Summary, 250
- Other BP-lowering therapies, 252
 - Hypnotics, 252
 - XOR inhibitor, 252
 - Herbal medication, 253

6 Renal denervation, 255

- Unsolved issues in the treatment of hypertension and the era for renal denervation, 255
- Hypothesis of perfect 24-hour BP control by renal denervation, 256
- History, 257
- Advances in devices, 262
 - Symplcity spiryal system (radiofrequency thermal ablation), 262
 - Iberis® system, 264
 - Paradise system (ultrasonic thermal ablation), 264

Peregrine system (trans-arterial alcohol injection),	265
Other energy modalities,	266
Evidence for renal denervation treatment of hypertension from Sham-controlled trials,	266
SPYRAL trials,	266
RADIANCE-HTN SOLO study,	268
Evidence from Japanese populations,	269
The Global SYMPLICITY Registry (GSR),	269
Safety of the renal denervation procedure,	270
24-hour BP lowering profile for cardiovascular protection,	270
Responders and clinical indications,	272
7 Blood pressure linked telemedicine and telecare,	278
Anticipation medicine,	278
Innovation technology,	280
Concept of “trigger” management,	282
Multisensors and the real-time hybrid Wi-SUN/Wi-Fi transmission system,	283
AI and anticipation models,	284
Development of wearable beat-by-beat (surge) BP monitoring,	285
Surge index,	292
Disaster cardiovascular prevention (DCAP) network,	294
Successful anticipation model of ICT-based BP control,	302
Disaster hypertension,	302
COVID-19 era,	305
8 Asia perspectives,	311
What is the HOPE Asia Network?,	311
HOPE Asia Network achievements,	312
Characteristics of cardiovascular disease in Asia,	315
Obesity and salt intake in Asia,	315
24-hour ambulatory BP profile in Asia,	320
Asia BP@Home Study,	325
References,	328
Index,	368

