



EUROPEAN COMMISSION
DIRECTORATE GENERAL for HEALTH and CONSUMERS
Consumer Affairs
Health technology and Cosmetics

MEDDEV 2.12/2 rev2

January 2012

GUIDELINES ON MEDICAL DEVICES

POST MARKET CLINICAL FOLLOW-UP STUDIES

A GUIDE FOR MANUFACTURERS AND NOTIFIED BODIES

Note

The present Guidelines are part of a set of Guidelines relating to questions of application of EC-Directives on medical Devices. They are legally not binding. The Guidelines have been carefully drafted through a process of intensive consultation of the various interest parties (competent authorities, Commission services, industries, other interested parties) during which intermediate drafts were circulated and comments were taken up in the document. Therefore, this document reflects positions taken by representatives of interest parties in the medical devices sector.

1 **CONTENTS**

2
3
4

5	1. Introduction.....	3
6	2. Scope.....	4
7	3. References.....	4
8	4. Definitions.....	6
9	5. Circumstances where a post market clinical follow up study in indicated.....	8
10	6. Elements of a post-market clinical follow up study.....	10
11	7. The use of study data	12
12	8 The role of the notified body in post-market clinical follow up	12

13

14

15 **Preface**

16 This document is intended to be a guide for manufacturers and Notified Bodies on
17 how to carry out Post-Market Clinical Follow-up (PMCF) studies in order to fulfil
18 Post-Market Surveillance (PMS) obligations according to Section 3.1 of Annex II,
19 Section 3 of Annex IV, Section 3 of Annex V, Section 3.1 of Annex VI or Section 4
20 of Annex VII of the Medical Devices Directive (93/42/EEC) and Section 3.1 of
21 Annex 2, Section 3 of Annex 4, Section 3.1 of Annex 5 of the Active Implantable
22 Medical Devices Directive (90/385/EEC). These Sections refer to requirements of
23 Annex X of Directive 93/42/EEC and Annex 7 of Directive 90/385/EEC, respectively.
24

25 Attention is drawn to paragraph 8 of Article 15 of Directive 93/42/EEC which spells
26 out the provisions of Article 15 that are not applicable to clinical investigations
27 conducted using CE-marked devices within their intended use.

28 Similarly when PMCF studies are conducted using CE marked devices within their
29 intended use, the provisions of section 2.3.5 of Annex X of Directive 93/42/EEC do
30 not apply. However, the provisions of Directive 93/42/EEC concerning information
31 and notification of incidents occurring following placing devices on the market are
32 fully applicable.

1. Introduction

While clinical evidence is an essential element of the premarket conformity assessment process to demonstrate conformity to Essential Requirements, it is important to recognise that there may be limitations to the clinical data available in the pre-market phase. Such limitations may be due to the duration of pre-market clinical investigations, the number of subjects and investigators involved in an investigation, the relative heterogeneity of subjects and investigators and/or the controlled setting of a clinical investigation versus the full range of clinical conditions encountered in general medical practice.

A precondition for placing a product on the market is that conformity to the relevant Essential Requirements, including a favourable benefit/risk ratio, has been demonstrated. The extent of the data that can be gathered in the pre-market phase does not necessarily enable the manufacturer to detect rare complications or problems that only become apparent after wide-spread or long term use of the device. As part of the manufacturer's quality system, an appropriate post-market surveillance plan is key to identifying and investigating residual risks associated with the use of medical devices placed on the market. These residual risks should be investigated and assessed in the post-market phase through systematic Post-Market Clinical Follow-up (PMCF) study(ies).

Clinical data obtained from post-market surveillance and during PMCF studies by the manufacturer are not intended to replace the pre-market data necessary to demonstrate conformity with the provisions of the legislation. However, they are critical to update the clinical evaluation throughout the life-cycle of the medical device and to ensure the long term safety and performance of devices after their placing on the market.

PMCF studies are one of several options available in post-market surveillance and contribute to the risk management process.

66

67 2. Scope

68

69 The objective of this document is to provide guidance on the appropriate use and
70 conduct of PMCF studies to address issues linked to residual risks. The intention is
71 not to impose new regulatory requirements.

72

73 PMCF studies are an important element to be considered in PMCF or PMS plans. The
74 principles for PMCF studies set out in this guidance are not intended to replace PMCF
75 or PMS plans. They are or may be applicable to PMCF studies conducted for other
76 purposes.

77

78 This document provides guidance in relation to:

- 79 i) the circumstances where a PMCF study is indicated;
- 80 ii) the general principles of PMCF studies involving medical devices;
- 81 iii) the use of study data (for example to update instructions for use and labelling);
82 and
- 83 iv) the role of a notified body for medical devices in the assessment of PMCF plans
84 and of the results obtained from the plans as part of conformity assessment.

85

86 This document does not apply to *in vitro* diagnostic devices.

87

88 3. References

89

90 **Council Directive 93/42/EEC of 14 June 1993 concerning medical devices** as last
91 amended by Directive 2007/47/EC of the European Parliament and of the Council of
92 5 September 2007.

93

94 **Council Directive 90/385/EEC** of 20 June 1990 on the approximation of the laws of
95 the Member States relating to active implantable medical devices last amended by
96 Directive 2007/47/EC of the European Parliament and of the Council of 5 September
97 2007.

98

99

100

101 **Interpretative Documents**

102

103 **MEDDEV 2.7.1** Clinical Evaluation: A Guide for Manufacturers and Notified
104 Bodies

105

106 **MEDDEV 2.7.1, Appendix 1**

107 Evaluation of Clinical Data – A Guide for Manufacturers and
108 Notified Bodies – Appendix 1: Clinical Evaluation of Coronary
109 Stents

110

111

112 **GHTF Final Documents:**

113 **SG1/N41:2005** Essential Principles of Safety & Performance of Medical Devices

114 **SG1/N44:2008** The Role of Standards in the Assessment of Medical Devices

115 **SG1/N065:2010** Registration of Manufacturers and Other Parties and Listing of
116 Medical Devices

117 **SG2/N47:2005** Review of Current Requirements on Post-Market Surveillance

118 **SG5/N1:2007** Clinical Evidence – Key Definitions and Concepts

119 **SG5/N2:2007** Clinical Evaluation

120 **SG5/N3:2010** Clinical Investigations

121

122

123 **International Standards:**

124 **EN ISO 14155:2011** Clinical investigation of Medical Devices for human subjects
125 Good clinical practice; Second edition 2011-02-01

126

127 **EN ISO 14971:2009** Application of risk management to medical devices

128

129 **Others:**

130 **US Department of Health and Human Service, Agency for Healthcare Research**
131 **and Quality:**

132 Registries for Evaluating Patient Outcomes: a User's Guide (Executive
133 Summary, April 2007).

134

135

136

137

138 4. Definitions

139

140

141 Clinical Data¹:

142 The safety and/or performance information that is generated from the use of a
143 device.

144 Clinical data are sourced from:

- 145 - clinical investigation(s) of the device concerned; or
- 146 - clinical investigation(s) or other studies reported in the scientific literature
147 of a similar device for which equivalence to the device in question can be
148 demonstrated; or
- 149 - published and/or unpublished reports on other clinical experience of either
150 the device in question or a similar device for which equivalence to the
151 device in question can be demonstrated.

152

153 Clinical Evaluation²:

154 The assessment and analysis of clinical data pertaining to a medical device to
155 verify the clinical safety and performance of the device when used as intended
156 by the manufacturer.

157

158 Clinical Evidence²:

159 The clinical data and the clinical evaluation report pertaining to a medical
160 device.

161

162 Clinical Investigation²:

163 Any systematic investigation or study in or on one or more human subjects,
164 undertaken to assess the safety or performance of a medical device.

165

166 Device Registry³:

167 An organised system that uses observational study methods to collect defined
168 clinical data under normal conditions of use relating to one or more devices to

¹ Council Directives 90/385/EEC and 93/42/EEC

² GHTF document SG5/N1R8: 2007: Clinical Evidence – Key Definitions and Concepts

³ GHTF document SG5/N4:2010: Post Market Clinical Follow-Up Studies, based on the definition in Agency for Healthcare Research and Quality, “Registries for Evaluating Patient Outcomes: A User’s Guide”, as modified.

169 evaluate specified outcomes for a population defined by a particular disease,
170 condition, or exposure and that serves predetermined scientific, clinical or
171 policy purpose(s).

172
173 Note: The term “device registry” as defined in this guidance should not be
174 confused with the concept of device registration and listing. (See GHTF
175 SG1N065)

176
177 **Post-market clinical follow-up (PMCF) study:**

178 A study carried out following the CE marking of a device and intended to
179 answer specific questions relating to clinical safety or performance (i.e. residual
180 risks) of a device when used in accordance with its approved labelling.

181
182 **PMCF plan:**

183 The documented, proactive, organised methods and procedures set up by the
184 manufacturer to collect clinical data based on the use of a CE-marked device
185 corresponding to a particular design dossier or on the use of a group of medical
186 devices belonging to the same subcategory or generic device group as defined
187 in Directive 93/42/EEC. The objective is to confirm clinical performance and
188 safety throughout the expected lifetime of the medical device, the acceptability
189 of identified risks and to detect emerging risks on the basis of factual evidence.

190
191 **Residual Risk:**

192 Risk remaining after risk control measures has been taken⁴ .
193

⁴ EN ISO 14971

195 5. Circumstances where a PMCF study is indicated

196

197 Following a proper premarket clinical evaluation, the decision to conduct PMCF
198 studies must be based on the identification of possible residual risks and/or unclarity
199 on long term clinical performance that may impact the benefit/risk ratio.

200

201 PMCF studies may review issues such as long-term performance and/or safety, the
202 occurrence of clinical events (e.g. delayed hypersensitivity reactions, thrombosis),
203 events specific to defined patient populations, or the performance and/or safety of the
204 device in a more representative population of users and patients.

205

206 Circumstances that may justify PMCF studies include, for example:

- 207 • innovation, e.g., where the design of the device, the materials, substances,
208 the principles of operation, the technology or the medical indications are
209 novel;
- 210 • significant changes to the products or to its intended use for which pre-
211 market clinical evaluation and re-certification has been completed;
- 212 • high product related risk e.g. based on design, materials, components,
213 invasiveness, clinical procedures;
- 214 • high risk anatomical locations;
- 215 • high risk target populations e.g. paediatrics, elderly;
- 216 • severity of disease/treatment challenges;
- 217 • questions of ability to generalise clinical investigation results;
- 218 • unanswered questions of long-term safety and performance;
- 219 • results from any previous clinical investigation, including adverse events
220 or from post-market surveillance activities;
- 221 • identification of previously unstudied subpopulations which may show
222 different benefit/risk-ratio e.g. hip implants in different ethnic
223 populations;
- 224 • continued validation in cases of discrepancy between reasonable
225 premarket follow-up time scales and the expected life of the product;
- 226 • risks identified from the literature or other data sources for similar
227 marketed devices;

228 • interaction with other medical products or treatments;
229 • verification of safety and performance of device when exposed to a larger
230 and more varied population of clinical users;
231 • emergence of new information on safety or performance;
232 • where CE marking was based on equivalence.
233
234 PMCF studies may not be required when the medium/long-term safety and clinical
235 performance are already known from previous use of the device or where other
236 appropriate post-market surveillance activities would provide sufficient data to
237 address the risks.
238
239
240
241

242

243 **6. Elements of a PMCF study**

244

245 Post-market clinical follow-up studies are performed on a device within its intended
246 use/purpose(s) according to the instructions for use. It is important to note that PMCF
247 studies must be conducted according to applicable laws and regulations and should
248 involve an appropriate methodology and follow appropriate guidance and standards.

249

250 PMCF studies must be outlined as a well designed clinical investigation plan or study
251 plan, and, as appropriate, include:

- 252 • clearly stated research question(s), objective(s) and related endpoints;
- 253 • scientifically sound design with an appropriate rationale and statistical analysis
254 plan;
- 255 • a plan for conduct according to the appropriate standard(s);
- 256 • a plan for an analysis of the data and for drawing appropriate conclusion(s).

257

258 **Objectives of PMCF studies**

259 The objective(s) of the study should be stated clearly and should address the residual
260 risk(s) identified and be formulated to address one or more specific questions relating
261 to the clinical safety or clinical performance of the device. A formal hypothesis
262 should be clearly expressed.

263

264 **Design of PMCF studies**

265 PMCF studies should be designed to address the objective(s) of the study. The design
266 may vary based on the objective(s), study hypothesis research question and endpoints
267 and should be scientifically sound to allow for valid conclusions to be drawn.

268

269 PMCF studies can follow several methodologies, for example:

- 270 • the extended follow-up of patients enrolled in premarket investigations;
- 271 • a new clinical investigation;
- 272 • a review of data derived from a device registry; or
- 273 • a review of relevant retrospective data from patients previously exposed to
274 the device.

275

PMCF studies should have a plan describing the design and methodologies appropriate for addressing the stated objectives. The clinical investigation plan/study plan should identify and where needed justify at a minimum:

- the study population (corresponding to the CE-mark scope);
- inclusion/exclusion criteria;
- rational and justification of the chosen study design including use of controls/control groups (where relevant; randomised or not);
- the selection of sites and investigators;
- study objectives and related study endpoints and statistical considerations;
- the number of subjects involved;
- the duration of patient follow-up;
- the data to be collected;
- the analysis plan including any interim reporting where appropriate to ensure continuous risk management based on clinical data; and
- procedures/criteria for early study termination;
- ethical considerations;
- methods of quality control of data where appropriate.

The points above may not all apply to a retrospective data review.

Implementation of the PMCF study, analysis of data and conclusion(s)

The study should:

- be executed with adequate control measures to assure compliance with the clinical investigation or study plan;
- include data analysis with conclusions drawn according to the analysis plan by someone with appropriate expertise; and
- have a final report with conclusions relating back to original objective(s) and hypothesis/hypotheses.

7. The use of study data

The data and conclusions derived from the PMCF study are used to provide clinical evidence for the clinical evaluation process. This may result in the need to reassess whether the device continues to comply with the Essential Requirements. Such assessment may result in corrective or preventive actions, for example changes to the labelling/instructions for use, changes to manufacturing processes, changes to the device design, or public health notifications.

8 The role of the notified body in PMCF

When auditing the quality system of the manufacturer in the framework of one of the conformity assessment annexes of Directive 90/385/EEC or of Directive 93/42/EEC, the Notified Body (NB) shall review the appropriateness of the manufacturer's general post-market surveillance procedures and plans, including plans for PMCF, as relevant.

The Notified Body shall verify that PMCF as part of the overall clinical evaluation is conducted by or on behalf of the manufacturer by appropriately competent assessors (as per section 10.3 of MEDDEV 2.7/1).

The NB shall verify that clinical investigations conducted as part of PMCF plans are conducted in accordance with the relevant provisions of Annex X (as per Article 15.8 of 93/42/EEC), related guidance and relevant standards.

The NB shall as part of its assessment of a specific medical device⁵:

- verify that the manufacturer has appropriately considered the need for PMCF as part of post market surveillance based on the residual risks including those identified from the results of the clinical evaluation and from the characteristics of the medical device in accordance with section 5 of the guidance;
- verify that PMCF is conducted when clinical evaluation was based exclusively on clinical data from equivalent devices for initial conformity

⁵ in accordance with Annex II.4, Annex II.7, Annex III, Annex V.6 and Annex VI.6 of Directive 93/42/EEC and Annex II.4, Annex II.7, Annex III and Annex V.6 of Directive 90/385/EEC

340 assessment and that PMCF addresses the residual risks identified for the
 341 equivalent devices;

- 342 • assess the appropriateness of any justification presented by a manufacturer
 343 for not conducting a specific PMCF plan as part of post market surveillance
 344 and seek appropriate remedy where the justification is not valid;
- 345 • assess the appropriateness of the proposed PMCF plan in demonstrating the
 346 manufacturer's stated objectives and addressing the residual risks and issues
 347 of long term clinical performance and safety identified for the specific
 348 device;
- 349 • verify that data gathered by the manufacturer from PMCF, whether
 350 favourable or unfavourable, is being used to actively update the clinical
 351 evaluation (as well as the risk management system);
- 352 • consider whether, based on the specific device assessment, data obtained
 353 from PMCF should be transmitted to the NB between scheduled assessment
 354 activities (e.g. surveillance audit, recertification assessment);
- 355 • consider an appropriate period for certification of the product in order to set
 356 a particular time point at which PMCF data will be assessed by the NB or
 357 specific conditions relating to certification for subsequent follow up. (This
 358 decision may be based on the residual risks, the characteristics presented in
 359 section 5 and the clinical evaluation presented at the time of initial
 360 assessment. Conditions the NB may consider could include the need for the
 361 manufacturer to submit interim reports between certification reviews, of the
 362 clinical data generated from the PMCF and post-market surveillance
 363 system).

364

