



**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**  
**6**  
**7**  
**8**  
**9**  
**10**  
**11**  
**12**  
**13**  
**14**

1. Introduction..... 3

2. Scope..... 4

3. References..... 4

4. Definitions..... 6

5. Circumstances where a post market clinical follow up study in indicated ..... 8

6. Elements of a post-market clinical follow up study..... 10

7. The use of study data ..... 12

8 The role of the notified body in post-market clinical follow up ..... 12

## 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.

## 33 1. Introduction

34

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

43

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

54

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

60

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

63

64

65

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 Data<sup>1</sup>:**

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 Evaluation<sup>2</sup>:**

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 Evidence<sup>2</sup>:**

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

161

### 162 **Clinical Investigation<sup>2</sup>:**

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 Registry<sup>3</sup>:**

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

---

<sup>1</sup> Council Directives 90/385/EEC and 93/42/EEC

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

<sup>3</sup> 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 taken<sup>4</sup> .

193

---

<sup>4</sup> 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

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

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

293

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

295

296

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

298 The study should:

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

305

306

307

## 308 **7. The use of study data**

309

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

316

## 317 **8 The role of the notified body in PMCF**

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

323

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

327

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

331

332 The NB shall as part of its assessment of a specific medical device<sup>5</sup>:

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

---

<sup>5</sup> 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