

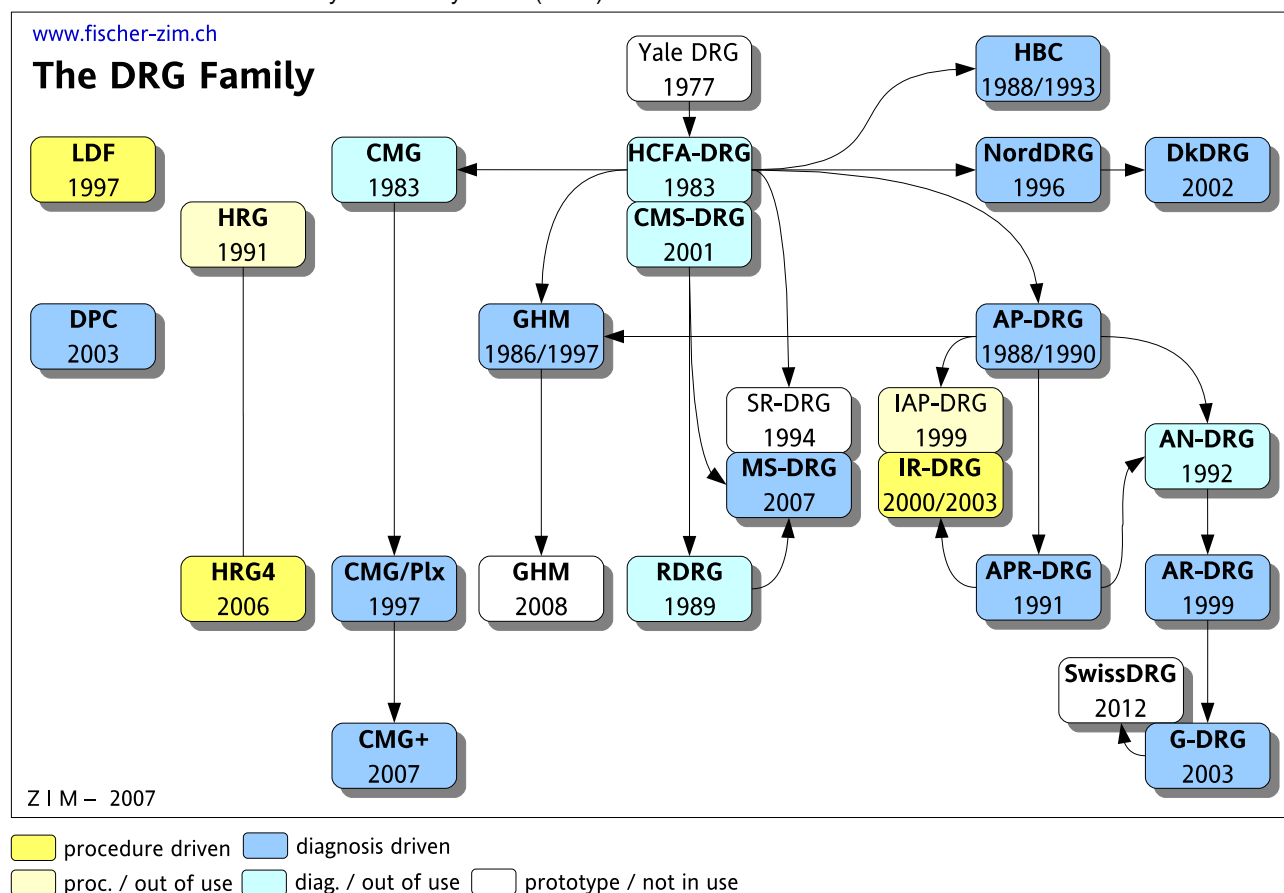
Wolfram Fischer

## The DRG Family

State of affairs: 2007

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**Table 1:** The Extended Family of DRG Systems (2007)



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## 1 Introduction

### 1.1 What are DRGs?

DRG systems

The abbreviation DRG signifies «Diagnosis Related Groups».<sup>1</sup> DRG systems are medico-economical patient classification systems. In acute hospitals, they allow for classification of hospital stays into a limited number of *clinically defined groups* with *costs of treatment* as *similar* as possible.

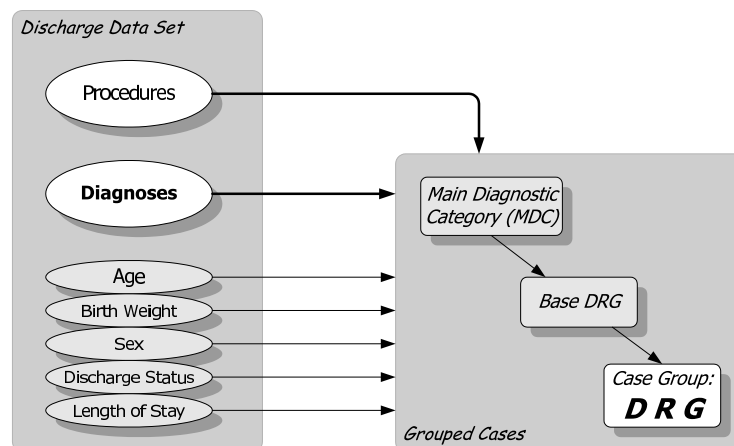
Case groups and grouping criteria

A *DRG system* consists of a list of individual *DRGs* which are labelled and codeable case groups. DRGs are defined by *grouping criteria* in a comprehensive framework of rules. *Specific figures* and *prices* can be attributed to each DRG.

Construction

To create DRG lists, list of diagnoses have been usually roughly structured and aggregated by groups of physicians. The fine-tuning was then elaborated often based on statistical analyses of cost data. (Because in the early days of the development of DRGs almost no cost data was available, length of stay was used as a proxy for cost.)

**Table 2:**  
Assignment of DRGs  
based on data from the  
discharge data set



Source: Fischer [DRG-CH, 2004].

Use of routine data

The development of DRG systems started in the late 70s in the United States. One of the framework conditions was that only data routinely collected was admissible. At that time, the discharge data set in US hospitals contained the following clinical data:

► Table 2

- principal and secondary medical diagnoses
- surgical and diagnostic procedures
- age and sex of patients

This data – together with the birth weight of newborns, which was later added – has ever since been the backbone of grouping criteria in DRG systems worldwide.

Hospital products

Such information made it possible to define a part of the products rendered by hospitals. While the first DRGs had been originally defined as part of a quality control project, they soon came to reflect the money value of treatments, and were used in price lists. 1983, "Medicare" of United States was the first insurance provider to use DRGs as a basis for reimbursement of hospital stays.

<sup>1</sup> Cf. Fetter et al. [DRGs, 1980]; Fetter et al. [DRGs, 1991]; Iezzoni [Risk Adjustment, 1994]; Fischer [PCS, 1997]; Fischer [DRG+Pflege, 2002].

## 1.2 Modes of DRG refinement

There are several DRG systems with the name extension "refined". This usually stems from the introduction of additional graduation of severity as part of further developing an earlier system. However, there are many ways such refinements had been carried out in time.<sup>2</sup>

Name extension  
«refined»

The first DRG system which was called "refined" was the RDRG system presented in 1989. The background for this was to *refine* the distinction between DRGs "with CC" (DRG with comorbidity or complications) and DRGs "without CC" used in the HCFA-DRG system. Thus, the RDRG system split up medical cases into three and surgical cases into four CC levels.

**Table 3:** DRG systems with different grades of refinement

Feature	HCFA	AP	RDRG	APR	AN	SR (MS)	AR	GHM	IR	HRG4
Year of publication	1983	1988	1989	1991	1992	1994	1999	1999	2000	2006
* = DRG system claims to be "refined" by its name			*	*		*	*		*	
<b>► Essential features</b>										
More than two CC levels used	-	x	x	x	x	x	x	x	x	x
Several CC lists used	-	-	x	x	-	-	x	-	-	x
Combinations of secondary diagnoses are considered	-	-	-	x	-	-	x	-	-	-
<b>► Additional features</b>										
Base DRGs are labelled (and can be encoded)	-	-	x	x	-	(x)	x	-	x	x
Each base DRG is subdivided into a constant number of CC categories	-	-	3 / 4	4 + 4	-	-	-	-	(3)	-

Later, American developers applied the term to other forms of refinement, as well, so that the word "refined" today can mean different things. It is though common to all these aspects that they always try to provide an ever more differentiated representation of severity of a case:

Refinement  
of severity  
► Tables 3 und 4

- All refined systems use *more than two CC levels*.
- Usually, there are *several CC lists* used for refinement (except in IR-DRG, SR-DRG and MS-DRG). This allows to define the severity of the secondary diagnoses in function of the base DRG and – if needed – of other criteria. (The ARDRG system uses a compilation of these lists in the shape of the "CCL matrix".)
- In some of the systems (APR-DRG and AR-DRG), combinations of *several secondary diagnoses* have an influence on the CC level. In other systems, the secondary diagnosis which triggers the highest CC level is chosen.

In parallel to the above, most systems also use *age groups*, more or less frequently, to represent differences in the severity of cases.

Age groups

<sup>2</sup> The following text was taken from: Fischer [SL/RefinedDRG, 2003].

Technique	System
Use of two CC levels (no "refinement")	• HCFA-DRG, NordDRG
Use of an additional CC level	• AP-DRG, AN-DRG, GHM
... and labelled base DRGs	• SR-DRG / MS-DRG • IR-DRG
Several CC lists and further differentiations of CC levels	• RDRG • AR-DRG • APR-DRG • CMG/Plx, CMG+ • HRG4 • GHM 2008

**Table 4:**  
Increasing differentiation  
of DRG systems

Increasing differentiation	Table 4 provides an approximate overview of the evolution of systems in relation to increasing differentiation of refinement,
Other approaches	Other approaches to represent the severity of acute inpatient cases were applied by: Disease Staging, PMC, EfP-GHM, LDF, as well as in the SQLape system developed by Yves Eggli (Lausanne). Another completion to conventionally structured DRG systems is represented by "unbundled HRGs" and by "supplementary fees" ("Zusatzentgelte") in the GDRG system.

## 2 The first stage of DRG development

In this chapter you will find brief information on the following systems:

1. Short Info: Yale DRG (USA)
2. Short Info: HCFA DRG (USA)
3. Short Info: AP-DRG (3M/USA)
4. Short Info: RDRG (USA)
5. Short Info: APR-DRG (3M/USA)

### 2.1 Yale DRG – Yale Diagnosis Related Groups

Originally: Quality assurance program	The fundamental work for developing patient classification systems based on the model of «Diagnosis Related Groups» (DRGs) began in the 70s of the last century: A group of researchers around Robert Fetter at Yale University had been requested by physicians of the university' own hospital to develop a program of "utilization review" and quality assurance. <sup>3</sup>
Further development: Remuneration system	This system has subsequently emerged into an instrument that could be used for payment of case-based lump sums.

### 2.2 HCFA DRG – Diagnosis Related Groups of the Health Care Financing Administration

First DRG system used for reimbursement	The HCFA-DRG system was the first one to be applied on a large scale. Since its first application in 1983 – with then 470 DRGs –, it was used by Medicare of United States as a basis for case-based reimbursement of hospital services (typically excluding the attending physician's fees).
System primarily for elderly patients	The primary goal of the HCFA-DRG system was to reproduce the cost intensity of all inpatient treatments. However, since Medicare is an insurance provider for the elderly, the disease patterns considered were primarily those of the aged population segment.
Splits added for pediatric patients	As a balance, important elements of the APDRG system have been adapted and taken over into the HCFA-DRG since its 8th revision (1990/91). <sup>4</sup> As a consequence, the HCFA-DRG system reveals a whole series of splits at the age of 17, which indicates that pediatric DRGs are also being considered. Thus, the HCFA-DRG system is, in principle, applicable as patient classification system to all patients; the cost weights published by HCFA and later by its successor CMS, however, relate to the elderly patients insured by Medicare.
«Pre-MDC» DRGs are not diagnosis related	The term "Diagnosis Related Groups" named the principle according to which a case is initially assigned to a Major Diagnostic Category (MDC) on the basis of the principal diagnosis. In the 8th version from 1991 of the HCFA-DRG system, though, "Pre-MDC" as a new Major Diagnostic Category was established to accommodate hospital stays primarily in a procedure-based approach. Thus, for instance, liver transplants and bone marrow transplants received their own DRGs, attributed independently of the principal diagnosis.

<sup>3</sup> Cf. Fetter et al. [DRGs, 1991]: 4 ff; Fischer [PCS, 1997]: 186 f.

<sup>4</sup> Cf. McGuire [DRG-Evolution, 1993]: 39.

In 2001, the "Health Care Financing Administration" (HCFA) was renamed "Centers for Medicare and Medicaid Services" (CMS). Thus, the HCFA-DRG system accordingly became CMS-DRG system.

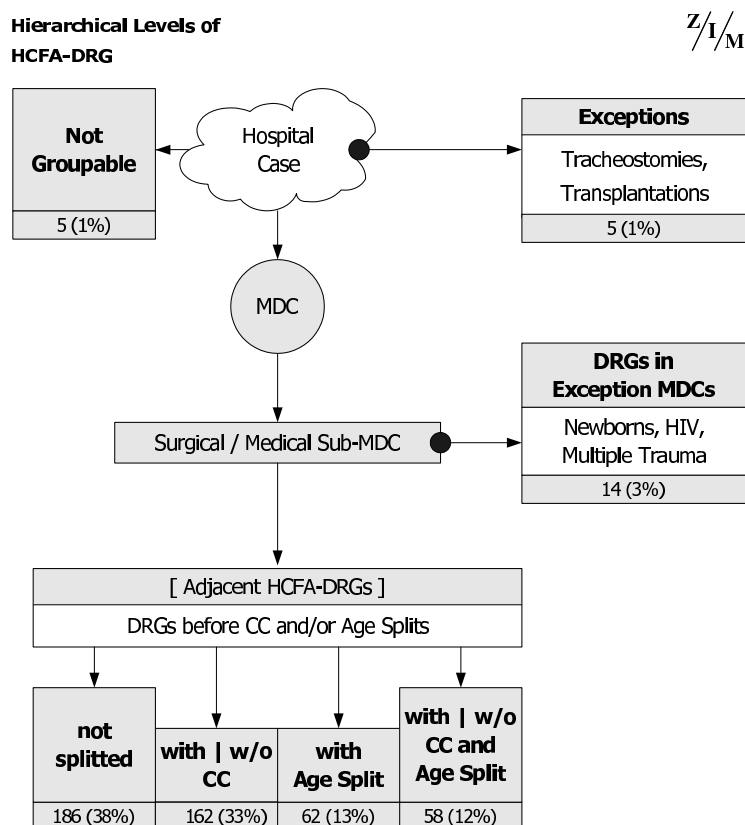
Since 2007/2008, the CMS-DRG system as Medicare's reimbursement system was replaced by the MS-DRG system.

From HCFA-DRG to **CMS-DRG**

Replaced by **MS-DRG**

↑ p. 21

**Hierarchical Levels of HCFA-DRG**



Numbers = count of groups in version 12.0 (in % of the total of 492 groups)

Source: Fischer [DRGs im Vergleich, 1999]: 41.

**Table 5:**  
Hierarchical levels of  
HCFA-DRGs

### 2.3 AP-DRG – All Patient Diagnosis Related Groups

The APDRG system is an extension of the spectrum of patients represented in the HCFA-DRG aimed to include "all patients" (= "AP"). This extension includes in particular: HIV infections, consideration of birth weight in newborns, differentiated consideration of diseases in children, and – in later versions – multiple trauma (in patients with at least two significant injuries). These extensions have been carried over in part into the 8th version of the HCFA-DRG system.

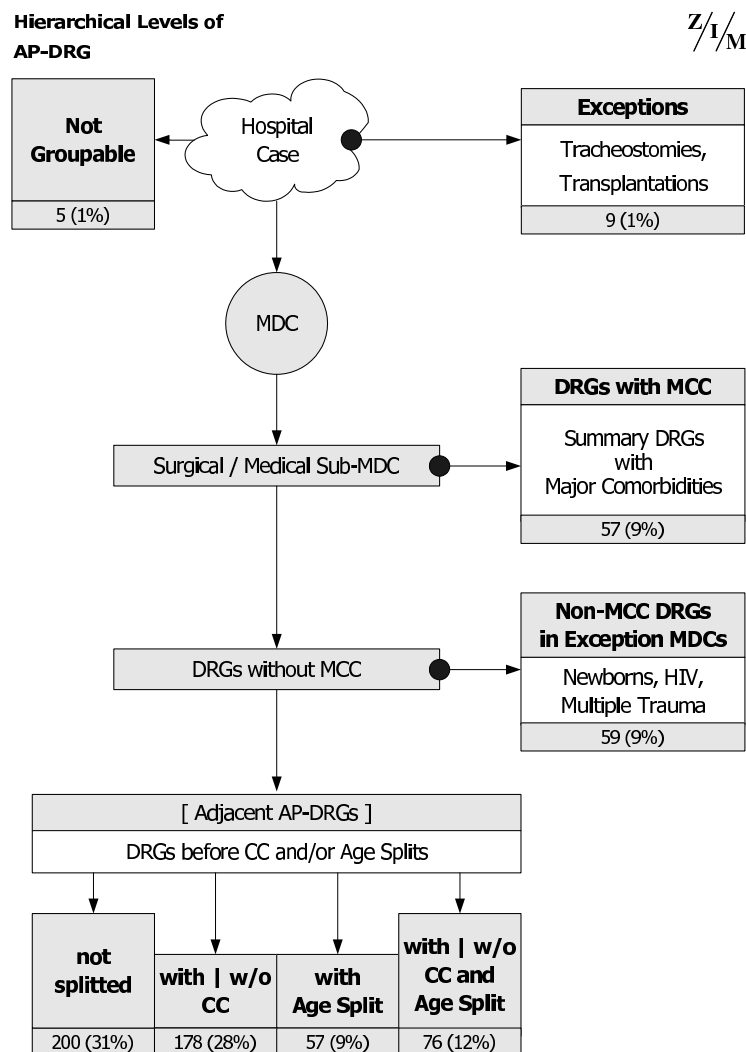
► Table 6

The APDRG system is a DRG system that contains 641 DRGs (version 12.0). It includes three CC levels:

- major co-morbidities or complications (MCCs = Major CCs)
- significant co-morbidities or complications (CCs)
- no significant co-morbidities or complications

By settling the MCCs on the level of Major Diagnostic Categories (and not on the level of the base DRGs, as in the RDRG project), the number of DRGs could be kept relatively low.

**Table 6:**  
Hierarchical levels of  
AP-DRGs



Numbers = count of groups in version 12.0 (in % of the total of 641 groups)

Source: Fischer [DRGs im Vergleich, 1999]: 42.

Basically, the APDRG system is revised annually. The last adjustments made in Europe however date back to version 12.0 from 1995. According to system developer 3M, the system can today be considered stable to a large extent. It is only being adjusted to the changes in the encoding systems which in the US are undertaken annually, too.

The first European version that was not based on American encoding systems was created for Wales, where the ICD-10 was used to encode diagnoses. This version has also been applied by the Swiss APDRG Association.

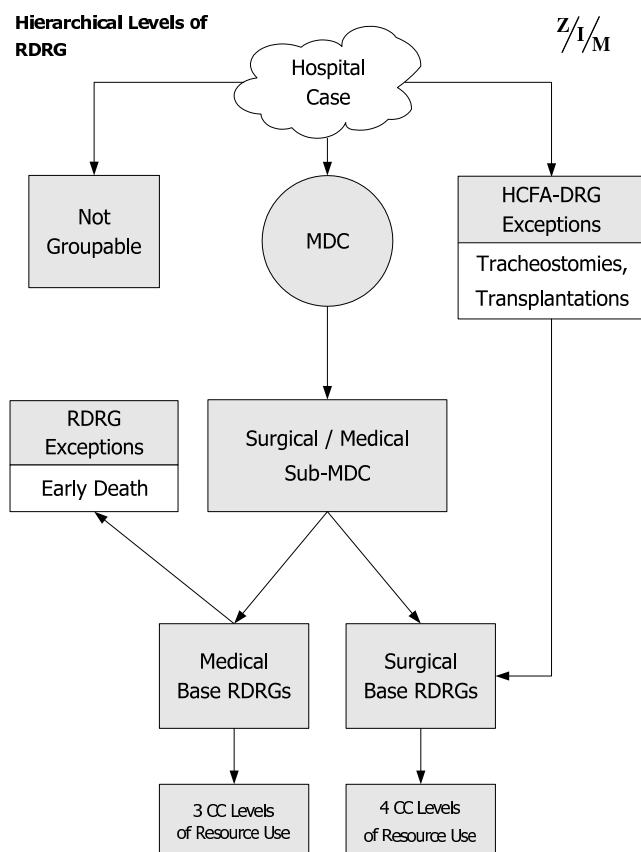
APDRG 12.0 in Europe

## 2.4 RDRG – Refined Diagnosis Related Groups

The RDRG system is a refinement of the HCFA-DRG system. All DRGs subdivided according to age and/or secondary diagnoses were merged in base RDRGs. They were then all divided into three medical and four surgical severity levels. To that end, several CC-lists were defined. (The previous HCFA-DRG system used only one such list.)

The severity level is assigned based on the most significant secondary diagnosis. In newborns, birth weight is used as an indicator. Patients who die during the first two days of their hospital stay are assigned to an RDRG named "early death in major category NN".

In 1989, the final report (on the second version) was published. The system comprised 1146 RDRGs (321 base RDRGs). For pediatric patients, separate cost weights were calculated.



**Table 7:**  
Hierarchical levels of  
RDRGs

Source: Fischer [DRG-Systeme, 2000]: 67.



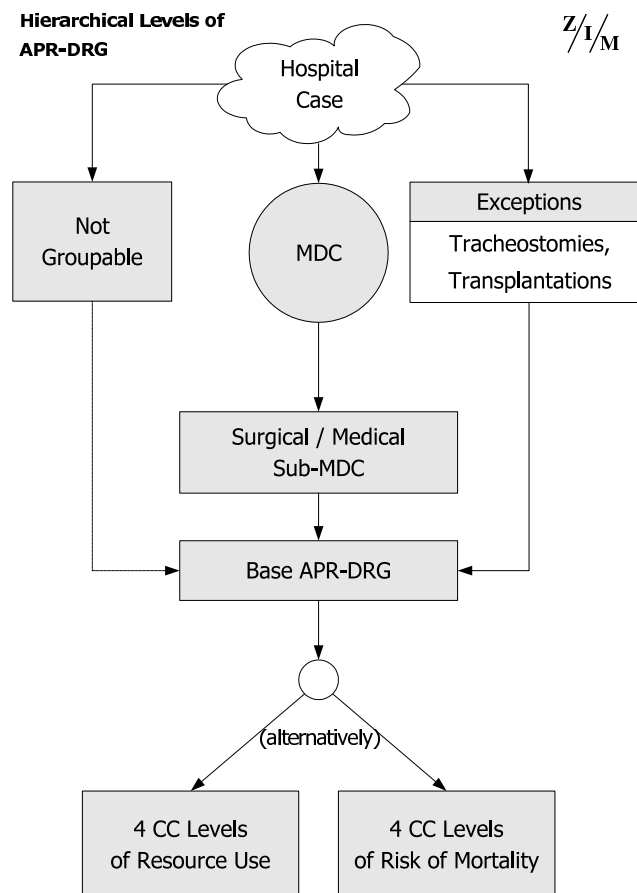
## 2.5 APR-DRG – All Patient Refined Diagnosis Related Groups

The APR-DRG system is a refinement of the AP-DRG system. All DRGs subdivided according to age/or secondary diagnoses were merged into base APR-DRGs. Two subdivisions of four stages each were applied throughout the system. One of them differentiates cases according to severity of disease, while the other operated according to mortality risk. Several CC-lists were used for this purpose.

The system was published in 1991. In its 9th version for 1991/1992 it comprised 1194 APR-DRGs (298 base APR-DRGs). In version 15, published for 1997/98, 1422 APR-DRGs (355 base APR-DRGs) were defined. In version 20 for 2002/03, 1258 APR-DRGs (316 base APR-DRGs) were defined.<sup>5</sup>

<sup>5</sup> Vgl. Averill et al. [APR-DRG 20.0, 2003].

**Table 8:**  
Hierarchical levels of  
APR-DRGs



Source: Fischer [DRGs im Vergleich, 1999]: 43.

### 3 Adaptations and further developments in other countries

In this chapter you will find brief information on the following systems:

1. Short Info: GHM (France)
2. Short Info: AN-DRG (Australia)
3. Short Info: NordDRG (Skandinavia)
4. Short Info: DkDRG (Denmark)

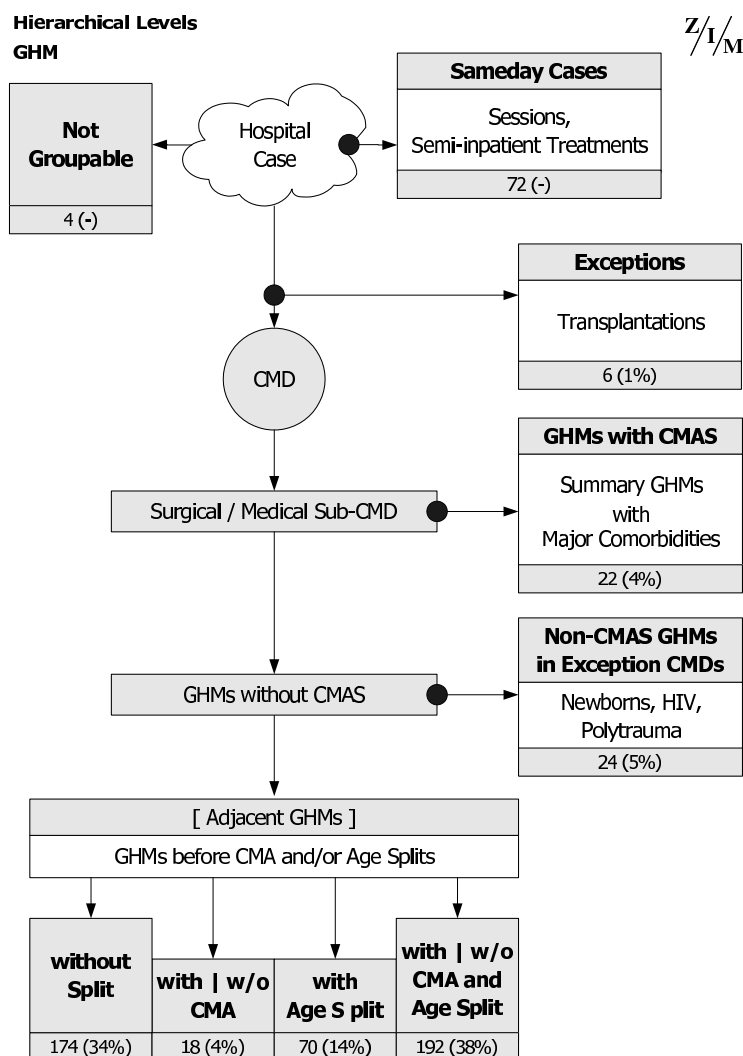
#### 3.1 GHM – Groupes homogènes de malades (France)

The "Groupes homogènes de malades" (GHM) were developed within the framework of the "Programme de médicalisation des systèmes d'information" (PMSI) and originally stem from the third HCFA-DRG version; they have been enhanced in their 1997 version with elements from APDRG.

The diagnoses are codified according to the ICD-10, while the procedures are encoded using the French catalogue of services "Catalogue des actes médicaux" (CdAM), and its successor, the "Classification Commune des Actes Médicaux" (CCAM), respectively.

DRG system with  
APDRG elements

Coding systems:  
ICD-10 + CCAM



Numbers = count of groups in version 5 (in % of the total 506 inpatient GHMs)

**Table 9:**  
Hierarchical levels of  
GHMs (Version 5)

Source: Fischer [DRG-Systeme, 2000]: 92.

4 severity levels

Budgeting since 1996

GHS lump sums  
since 2004

For 2008, a fundamental revision of the system to address the introduction of a GHM-based reimbursement system is currently in process.<sup>6</sup> A fourth CC level will be introduced. For hospital stays under two days, three main categories (CMD 25 – 27) are defined.

Instead of DRGs, France has GHMs (Groupes homogènes de malades). Since 1996, the GHM system is being used to calculate the budgets of public hospitals.

Since 2004 (with a transition time until 2012), the GHM system is used for reimbursement.<sup>7</sup> This project is named "Tarification à l'activité" (T2A). For that end, "Groupes homogènes de séjours" (GHS) were defined by the insurance providers: For each GHM, there is one, sometimes more than one GHS. For each GHS, several cost weights are defined. They depend upon the type of the financing of the hospital. To calculate GHS lump sums, cost surveys were made in public and private not-for-profit hospitals. The lump sums for the remaining private hospitals were calculated on the basis of their bills.

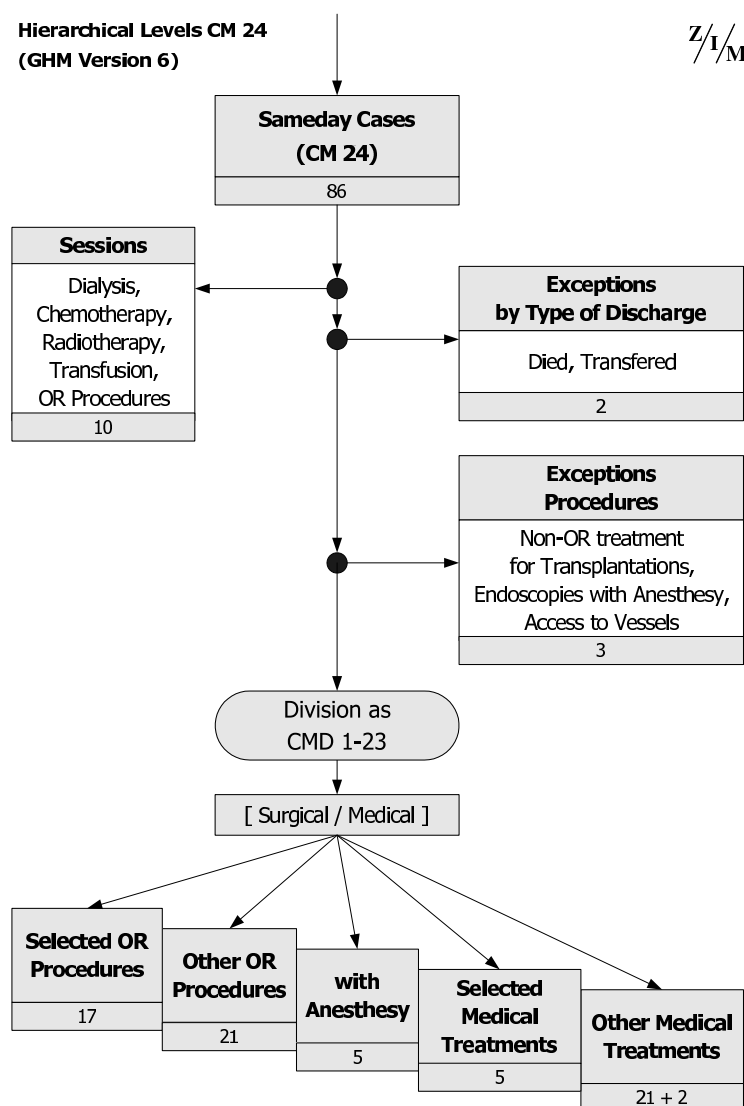
Exceptions with a remuneration of more than one GHS lump sum are e. g. palliative stays, radiotherapies, or dialyses.

In addition to the stay related lums sums, department type dependant daily lump sums are paid for treatment on specialised departments in reanimation, intensive care, monitoring, and neonatology.

<sup>6</sup> Cf. ATIH [GHM 11, 2006].

<sup>7</sup> Cf.: Andréoletti et al. [T2A, 2007] and also: Heller [GHM, 2007]: 118 f.

**Table 10:**  
Hierarchical levels for  
same-day cases in the  
GHM system (version 6)



Source: Fischer [DRG-Systeme, 2000]: 92.

### 3.2 AN-DRG – Australian National Diagnosis Related Groups (Australia)

The first version of the ANDRG system was published in 1992. It originated from the APR-DRG system in use at that time,<sup>8</sup> and also included functions of the APDRG and RDRG systems.<sup>9</sup> For instance, there was no single CC list covering all groups as in the HCFA-DRG and APDRG systems. For each AN-DRG, an own list of significant co-morbidities was established.

The first version of the ANDRG system (1.0) of 1992 contained 527 DRGs, while the last version (3.1), issued in 1996, comprised 667 ANDRGs.

In 1998, the system was thoroughly recast and made independent. It was then renamed "Australian Refined Diagnosis Related Groups" (AR-DRG).

Replaced by **AR-DRGs**

↑ p. 17

### 3.3 NordDRG – Nordic Diagnosis Related Groups (Skandinavia)

Starting in 1995, Scandinavian countries jointly developed the NordDRG grouper, which emulated the HCFA-DRG system version 12.0. This paved the way for the maintenance and development of a DRG version that would take into account national needs in differentiated ways. Participating countries were Denmark, Finland, Norway and Sweden. The system is also being used by Iceland.

Since 1999 at latest, participating countries have been using the ICD-10 to encode diagnoses, and the newly developed "Nordic Classification of Surgical Procedures" (NCSP) for codification of procedures.

ICD-10 and NCSP

As the NordDRG grouper uses decision tables instead of decision trees, it is more transparent than the DRG systems of United States.<sup>10</sup>

Decision tables

The complete definitions manual is available on the internet.<sup>11</sup>

Manual in the Internet

For sameday surgical procedures (not requiring inpatient care) and other outpatient treatments a reduced system called "NordDRG-O" has been developed. (The "O" in the acronym stands for "outpatient".) NordDRGs for medical treatments and treatments with complications or co-morbidities were skimmed off, while about 40 new NordDRGs were created for endoscopy and small procedures.<sup>12</sup>

"NordDRG-O" since 2002  
for outpatient treatment

### 3.4 DkDRG – Danish Diagnosis Related Groups (Denmark)

In Denmark, since 2002, a national system exists. It is named DkDRG. It is based on the NordDRG system.<sup>13</sup>

In order not to create incentives for unnecessary hospital stays, so-called «grey-zone» procedures were implemented. For such treatments, a DRG lump sum was established regardless of the type of hospital stay (in- or outpatient treatment).<sup>14</sup>

«Grey-zone»  
procedures

<sup>8</sup> Cf. Commonwealth of Australia [AN-DRG, 1994]: 13 f.

<sup>9</sup> Cf. Commonwealth of Australia [AN-DRG, 1994]: 19.

<sup>10</sup> Although such decision trees are represented in the electronic NordDRG manual, the grouping process and all adjustments are still made using decision-making tables.

<sup>11</sup> [http://www.nordcase.org/eng/norddrgr\\_manuals\\_versions/](http://www.nordcase.org/eng/norddrgr_manuals_versions/).

<sup>12</sup> Cf. Fernström [NordDRG-O, 2002]; Fernström [NordDRG-O, 2001].

<sup>13</sup> Cf. Kristensen [DkDRG, 2001]; Christensen [DkDRG, 2001].

<sup>14</sup> The concept of "grey-zone" procedures was developed within the Norwegian ministry of health. – Vgl. DMH [Casemix in Europe, 1999]: 39 f.

## 4 Country self-developments

In this chapter you will find brief information on the following systems:

1. Short Info: HRG (UK)
2. Short Info: CMG (Canada)
3. Short Info: LDF (Austria)
4. Short Info: FP/SE (Germany)
5. Short Info: HBC (Hungary)
6. Short Info: DPC (Japan)

### 4.1 HRG – Healthcare Resource Groups (UK)

Aim: «Better than DRG»	After some previous unsuccessful attempts with american DRG systems, the HRG system has been developed in the early 90s with the aim to define more homogenous patient categories compared to DRGs. <sup>15</sup>
	The two most significant divergences from the construction principles of standard DRG systems were:
	<ul style="list-style-type: none"> <li>• Priority was given to the principal procedure over the principal diagnosis, as primary criterion for grouping of cases.</li> <li>• Definition of not just one single CC list for all base DRGs, but of one CC list for each main category.</li> </ul>
First version: 1991 Fundamental recast: 2006 HRG based remuneration since 2006	The first HRG version containing 522 patient categories was published in 1991. A fundamental recast has been carried out in 2007, baring the name "HRG4" and including 1404 patient categories. In this version, three severity grades are applied. The HRG system has been applied for remuneration since 2006 within the framework of the "Payments by Results" program.
Multiple Grouping	For some activities and cost elements, a number of 160 «unbundled» HRGs were created in the new HRG4 system. <sup>16</sup> These can be attributed to treatment cases in addition to the usual HRGs.

### 4.2 CMG – Case Mix Groups (Canada)

HCFA-DRG descendant	In Canada, a first CMG system was introduced as early as 1983. It was inspired by the HCFA-DRG system. <sup>17</sup>
Own terms	There are some peculiarities concerning terminology here. Instead of "Major Diagnostic Categories" (MDCs), "Major Clinical Categories" (MCCs) were used. And instead of the principal diagnosis, the CMG-grouping used the "Most Responsible Diagnosis" (MRDx) as its starting point. (The concept points out the "most important" diagnosis, that is, the one with greatest influence on the length of stay.)
CMG/Plx	In 1997, the system was restructured. All age and CC-splits were eliminated. Instead, four "Complexity Levels" and three age levels were defined. The revised system was then renamed "Case Mix Groups with Complexity Overlay and Age Adjustment" (CMG/Plx). It carried 477 CMGs, encompassing 3413 refined "APLX groups". <sup>18</sup>
CMG+	In 2007, a further fundamental recast followed. <sup>19</sup> The number of main categories was reduced from 25 to 21. CC lists were defined for each main category. A total of 558 base CMGs were defined.

<sup>15</sup> NCMO-UK [HRG1, 1991]: 10.

<sup>16</sup> «Unbundled HRGs» encompass: dialysis, chemotherapy, radiotherapy, interventional radiology, imaging procedures, rehabilitation treatment (HRGs with per diem rates!), palliative medicine, adult/pediatric/neonatal intensive care, expensive drugs. – The Casemix Service [HRG4/Unbundling, 2007].

<sup>17</sup> Cf. CIHI [Grouping Methodologies, 2004]: 5 f.

<sup>18</sup> Benoit et al. [CMG/CW-Calc, 2000].

<sup>19</sup> Cf. CIHI [CMG+ Tool Kit, 2007].

The base CMGs could now be split, according to needs, by using up to five pre-defined "factors":

- Age categories (9 levels).
- Co-morbidity driven severity categories (5 levels).
- Flagged interventions (lists for 14 categories of interventional procedures).
- Number of interventions (3 categories).
- Interventions carried out outside the hospital (list).

Five potential split variables

### 4.3 LDF – Leistungsbezogene Diagnosen-Fallgruppen (Austria)

The patient classification system "Leistungsbezogene Diagnosen-Fallgruppen" (LDF) is part of the austrian hospital financing system "Leistungsorientierte Krankenanstalten-Finanzierung" (LKF) which was introduced in 1997.

In the case of surgical procedures, the system allocates procedure-driven LDFs, while medical treatment is diagnosis-driven.

The first version of 1997 defined 916 groups (contained in 394 base groups). The version of 2008 resulted in 900 LDFs (contained in 421 base LDFs).

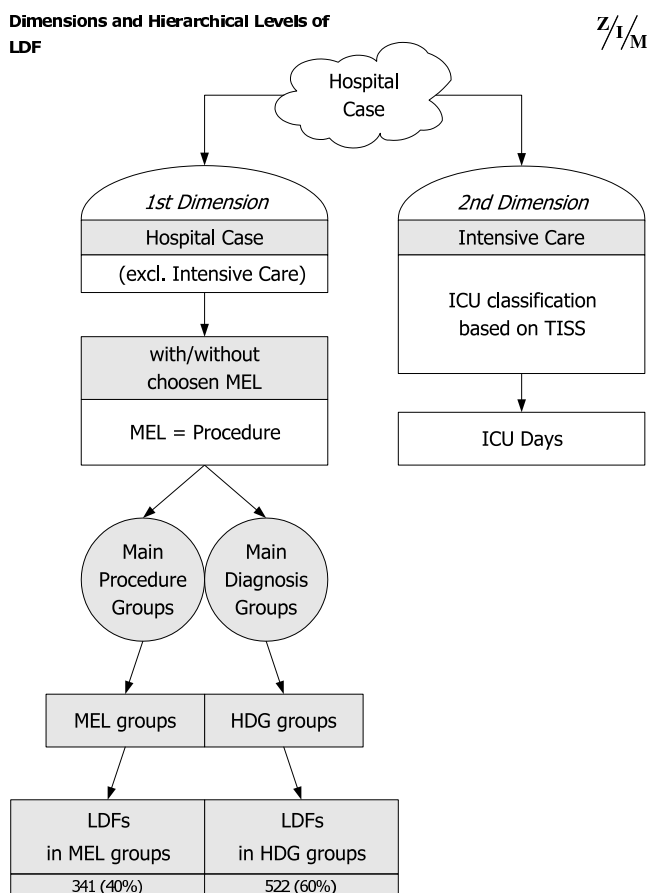
Payment consists of one or several case-based lump sums (called "Leistungskomponenten", daily lump sums ("Tageskomponenten"), as well as additional daily lump sums for days spent in intensive care units. Additional days for long outliers are reimbursed by decreasing daily lump sums.

Introduced 1997

Surgical LDFs are procedure related  
About 900 groups

Combination of case  
Kombination von Fall-  
und Tagespauschalen.

**Dimensions and Hierarchical Levels of LDF**



Numbers = count of groups in version LDF99  
(in % of the total of 863 groups)

**Table 11:**  
Hierarchical levels of the  
Austrian LDF System

Source: Fischer [DRGs im Vergleich, 1999]: 44.

#### 4.4 FP/SE – Fallpauschalen und Sonderentgelte (Germany)

In 1995, 73 case lump sums ("Fallpauschalen") and 147 special fees ("Sonderentgelte") were introduced in Germany. In 1996, they allowed for about 20 % until 25 % of the total hospital turnover to be billed using case lump sums and/or special payments.<sup>20</sup>

Replaced by **G-DRG**

↑ p. 19

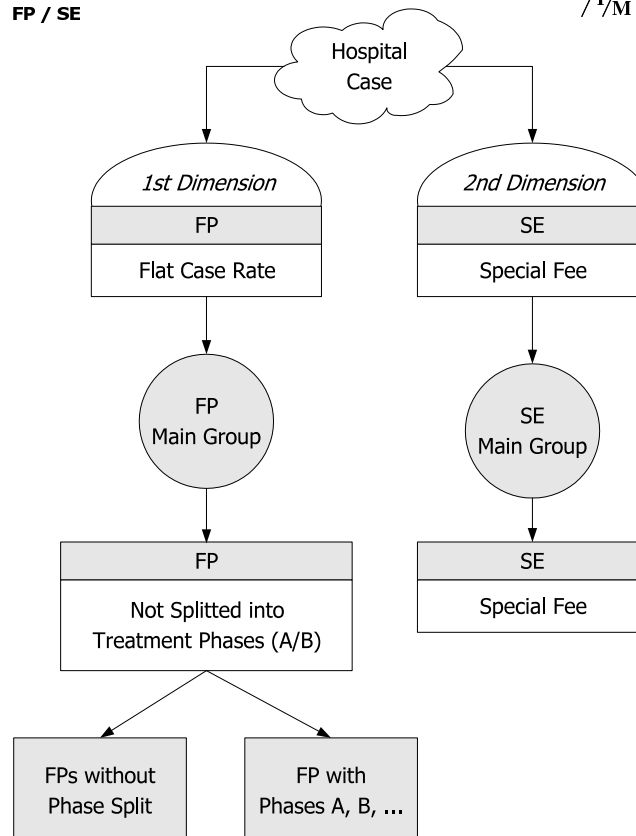
In 2003 the FP/SE system gave way to the GDRG system.

<sup>20</sup> With the FP/SE system, treatments were paid either (a) using a case lump sum or (b) by means of one or several special fees in addition to a daily "base care rate" ("Basispflegesatz"), or (c) by one or several daily "department related rates" («Abteilungspflegesätze») plus a daily "base care rate" ("Basispflegesatz").

**Table 12:**  
Hierarchical levels of the  
German FP/SE system

**Dimensions und Hierarchical Levels of  
FP / SE**

Z/I/M



Source: Fischer [DRGs im Vergleich, 1999]: 45.

#### 4.5 HBC – Homogén Betegség-Csoportok (Hungary)

Due to language limitations, I have relatively little knowledge about the Hungarian system. But thanks to a long-lasting participation of Hungarian experts in PCS/E conferences,<sup>21</sup> some of texts on the HBC system were also made available in English.

The first Hungarian DRG projects date back to 1986. In 1993, an HBC-based remuneration was introduced.<sup>22</sup> There were 467 groups defined.<sup>23</sup> As in many other countries, the first DRG case lump sums introduced in Hungary were initially applied using hospital-specific base rates.<sup>24</sup> – Version 5.0 of 2005 comprised 796 HBCs.<sup>25</sup>

HBC lump sums  
since 1993

In 2006, for several chemotherapy schemes 16 HBCs based on therapy cycles were introduced. Within such an HBC, chemotherapy can be initiated in accordance with distinct protocols. The cost weight is identical for all protocols. It refers to a treatment cycle (and not to the whole treatment case). Also, it does not depend on whether the patient is treated inpatient or outpatient. Expected length of stays and trimpoints, as well as number of phases per cycle depend on the protocol chosen.<sup>26</sup>

Chemotherapy HBCs

#### 4.6 DPC – Diagnosis Procedure Combinations (Japan)

In Japan in 2003, DPCs containing 2552 patient categories were introduced as a payment instrument for 80 academic hospitals and two special hospitals.<sup>27</sup> In 2005, the DPC system comprised 2335 patient categories.<sup>28</sup> Classification criteria were: principal diagnosis with secondary diagnoses, as well as the most resource-intensive procedure. The system is structured according to 1860 diagnoses (ICD-10), 475 diseases and 16 main categories.

Payment to hospitals consists of a DPC-payment plus reimbursements for selected individual services. The DPC-amount is called "hospital's fee". It is paid by daily lump sums: These covers accommodation services, examinations, supplies used in the wards, as well as interventions that cost less than 10,000 ¥ (approx. 85 USD). Fees for services ("doctor's fee") include all interventions that cost more than 10,000 ¥, as well as drugs and supplies used in surgical operations.<sup>29</sup>

DPC per diem rates  
combined with fee for  
service

The number of daily points per DPC is separately defined for three different time stages:<sup>30</sup>

- Stage 1 lasts up to the first quartile of the length of stay. For this purpose, daily DPC-points are calculated as 115 % of the average DPC cost weight.
- Stage 2 lasts from the first quartile to the expected average length of stay. In this stage, the average remaining number of points is used as cost weight which is calculated as difference between the 'DPC daily cost weight multiplied by the expected average duration of stay' and the 'daily DPC cost weight increased by 15 %, and multiplied by the first quartile of the duration of stay'.
- In the following stage 3 (which comes after the expected average length of stay), 85 % of the daily points of stage 2 are charged.
- For days longer than the average plus the double standard deviation of length of stay, fee for service is paid.

Drei Phasen mit  
unterschiedlichen  
DPC-Tagespunkten

The so calculated DPC points are multiplied by hospital specific coefficient, and by a base rate (of 10 ¥ per DPC point).

Hospital specific base  
rates

<sup>21</sup> <http://www.pcsinternational.org/>.

<sup>22</sup> Cf. Nagy [HBC year 1, 1994]; Broncz et al. [HBC, 2004].

<sup>23</sup> Rodrigues et al. [HBC, 1994]: 28.

<sup>24</sup> Bordás et al. [HBC, 1995]: 189;

<sup>25</sup> [www.gyogyinfok.hu/magyar/prog\\_archiv.html](http://www.gyogyinfok.hu/magyar/prog_archiv.html) [2008-01]

<sup>26</sup> Nagy et al. [HBC Chemotherapy, 2007].

<sup>27</sup> Cf. Matsuda et al. [DPC, 2003].

<sup>28</sup> Ishikawa et al. [DPC, 2005]: 1619. – According to Anan et al. [ICD-10 + DPC, 2007] (p. 1 f) in 2007 there were 3100 patient categories, of which 1700 could be reimbursed. – Additional reference can be found in PMA [Regulations in Japan, 2007] (p. 156): According to this source, the number of DPC categories had been reduced to 1438 per April 2006. As of July 2006, 360 hospitals were applying this system.

<sup>29</sup> Anan et al. [ICD-10 + DPC, 2007]: 1 f.

<sup>30</sup> Vgl. Ishikawa et al. [DPC, 2005]: 1617–1618.



## 5 The Australian system and its successors

In this chapter you will find brief information on the following systems:

1. Short Info: AR-DRG (Australia)
2. Short Info: G-DRG (Germany)
3. Short Info: SwissDRG (Switzerland)

### 5.1 AR-DRG – Australian Refined Diagnosis Related Groups (Australia)

The ARDRG system was created in 1998 as an original Australian product based on the experience previously gathered from the DRG-inspired system called "AN-DRG".<sup>31</sup> In its version 4.1 from 1999, it consisted of 409 base ARDRGs and 661 ARDRGs

A particular feature of the ARDRG system is the CCL matrix (CCL = Complication and Comorbidity Level). In a space-saving way, it allows for each secondary diagnosis to be split into different severity levels depending on the base ARDRG.

Out of the combination of the CCL values of all secondary diagnoses, the "Patient Clinical Complexity Level" (PCCL) is determined. In order to operate with the least number of ARDRGs, PCCLs are subsequently aggregated into one up to four severity categories per base ARDRG.<sup>32</sup>

CCL matrix

► Table 14

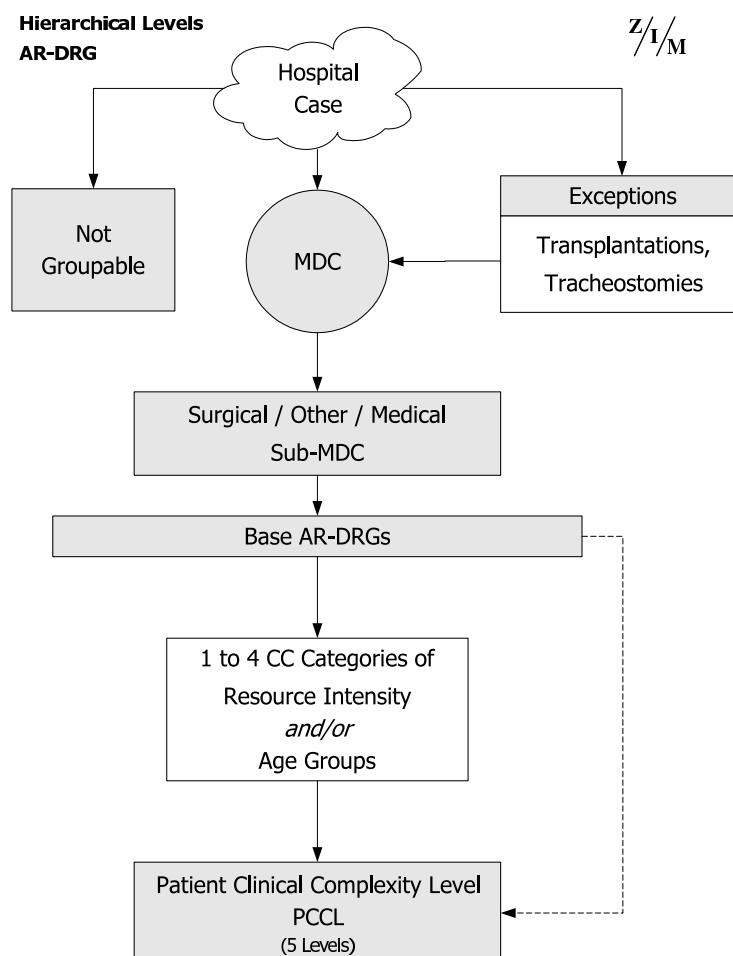
PCCL = Patient Clinical Complexity Level

► Table 15

<sup>31</sup> The last version of AN-DRG (from 1996) was 3.1; so the first version of AR-DRG (from 1998) was numbered as version 4.0.

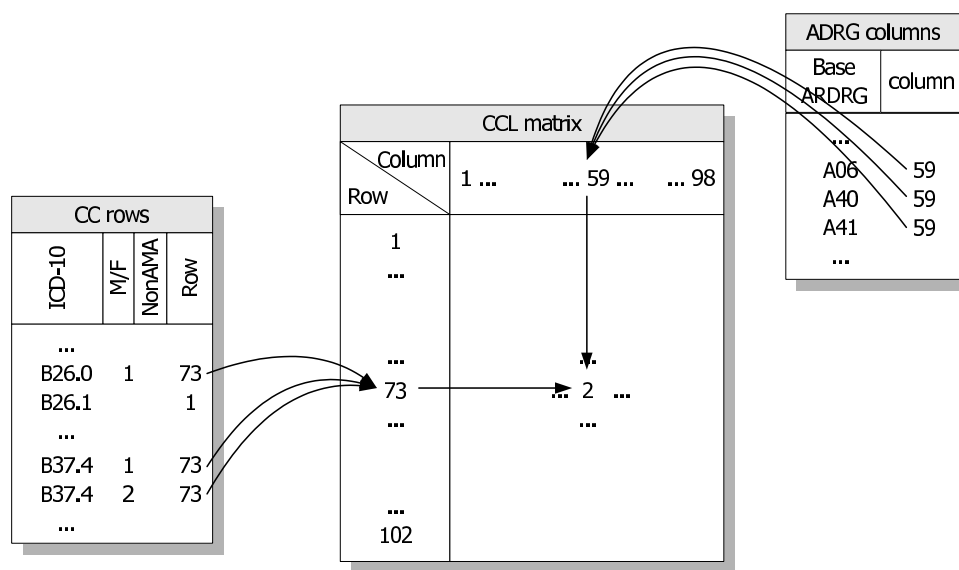
<sup>32</sup> Severity categories are marked with letters "A" to "D" or with "Z". "Z" is used for ARDRGs without splitting into severity categories.

**Table 13:**  
Hierarchical levels of  
AR-DRGs



Source: Fischer [SL/AR-DRG, 2000].

Z/M

**CCL matrix (AR-DRG)****Table 14:**  
CCL matrix

(IX=ARDRG=gesund/CCLMatrix - 31.3.11)

Source: Fischer [AR-DRG, 2001].

Severity Category	CCL(Dg1)	CCL(Dg2)	CCL(Dg3)	CCL(Dg4)	CCL(Dg5)	CCL(Dg6)
PCCL = 4 (CCC)	4	3				
	4	2				
	4	1	1			
	3	3				
	3	2	2			
	3	2	1	1		
	2	2	2	2		
	2	2	2	1	1	1
PCCL = 3 (SCC)	4					
	4	1				
	3					
	3	2				
	3	2	1			
	2	2				
	2	2	2			
	2	1				
	1	1	1	1		
PCCL = 2 (CC)	2					
	1	1				
PCCL = 1 (-)	1					
PCCL = 0 (-)						

**Table 15:**  
CCL combinations and  
the resulting PCCLs

## 5.2 G-DRG – German Diagnosis Related Groups (Germany)

Starting point:  
ARDRG-4.1  
Seither:  
Umfangreiche  
Änderungen

The first version of the GDRG system was a translation of the ARDRG 4.1 system, based on the German encoding systems ICD-10-GM and OPS-301.

Subsequently, the system has been revised annually on the basis of cost data processed initially by slightly over 100, and later by over 200 hospitals. Except for the fundamental methodology of the CCL matrix, which was preserved, considerable changes were made that resulted in a softening of the principle of Base DRGs, and gave birth to some quite complex GDRG labels.<sup>33</sup>

The 2003 GDRG system comprised a number of 664 GDRGs. Each version introduced since has extended this catalogue by 50 to 100 new case groups. The GDRG system of 2008 defines 1137 GDRGs.

## 5.3 SwissDRG – Swiss Diagnosis Related Groups (Switzerland)

«Helvetised» GDRG  
system

By the end of 2005, a decision was taken in Switzerland to adopt a "Helvetised" (= made Swissish) version of the G-DRG system, and call it SwissDRG system. It is planned to use this system for payments as of 2012.

Grouper 0.0 (2007)

The first preparatory work was done on the GDRG-2006 grouper: the German ICD-10-GM and OPS-301 codes were replaced with the Swiss Codes based on ICD-10 and CHOP. The grouping of pre-existing Swiss data resulted in 814 GDRGs (out of a total of 954 defined GDRGs). 586 of the GDRGs taken were rateable.<sup>34</sup>

<sup>33</sup> As an example, I present here the translated label of GDRG-2008 B02B: "Complex Craniotomy or Spinal Procedure or Other Expensive Nervous System Procedure With Motor Ventilation Over 95 Hours, Without Radiotherapy More Than 8 Sessions, Age < 6 Years or Age < 18 Years With Major Intracranial Procedure, With Catastrophic CC or Motor Ventilation Over 95 Hours and Motor Ventilation Under 178 Hours" (German original text: "Komplexe Kraniotomie oder Wirbelsäulen-Operation od. andere aufwändige Operation am Nervensystem mit Beatm. > 95 Std., ohne Strahlenth. > 8 Bestrahl., Alter < 6 J. od. < 18 J. mit grossem intrakr. Eingr., m. äusserst schw. CC od. Beatm. > 95 und < 178 Std."). – Cf. Fischer [DRG Labels, 2007]; Fischer [GDRG-Verständlichkeit, 2007].

<sup>34</sup> To illustrate one especially grave difficulty in the process of "Helvetisation", it should be mentioned here that data on long-term artificial respiration was missing in the Swiss discharge data set. As a consequence, a whole series of GDRGs could actually not be assigned to the existing Swiss data. The respective cases are included in other GDRGs whose case weights and boundary values they made soaring up. Cf. Braun/Jacobs [Helvetisierung, 2007]: 25 ff.

## 6 Further developments in the United States

In this chapter you will find brief information on the following systems:

1. Short Info: SR-DRG (USA)
2. Short Info: MS-DRG (USA)
3. Short Info: IAP-DRG (3M/USA)
4. Short Info: IR-DRG (3M/USA)

### 6.1 SR-DRG – Severity-Refined Diagnosis Related Groups

The SRDRG system is a refinement of the HCFA-DRG system. It uses three, instead of two severity levels. The new system was developed by 3M, as commissioned by HCFA.

A first draft was presented in 1994. It contained 652 SR-DRGs. It never got to be used, though, because unacceptable redeployments in payments of hospitals were feared.

Later, the SRDRG system was recast with up-to-date data as MSDRG system. It is in use since 2007/08 for Medicare payments.

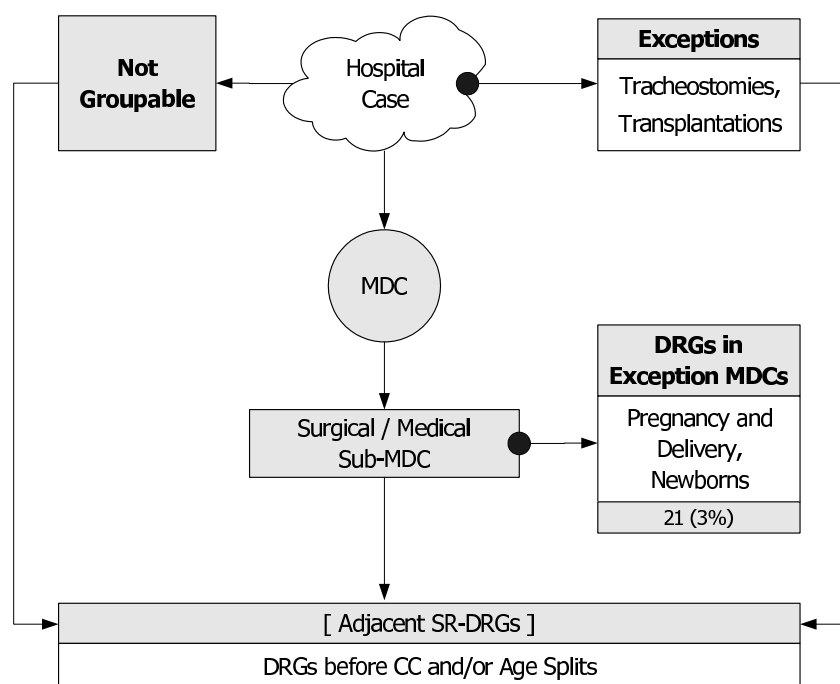
HCFA-DRG refinement

Test system

Implemented as  
**MS-DRG**

↑ p. 21

**Hierarchy Levels of  
SR-DRG**



Z/I/M

**Table 16:**  
Hierarchical levels of  
SR-DRGs

	Age < 18	Age > 17	w/o Age Split	Sum
w/o Multimorbidity	42	10	76	128 (20%)
MCC	.	19	118	137 (21%)
CC	.	13	72	85 (13%)
MCC or CC	.	15	57	72 (11%)
without MCC	.	6	46	52 (8%)
without CC	.	28	129	157 (24%)
Sum	42 (6%)	91 (14%)	498 (76%)	631 (97%)

Numbers = count of groups in version 12.0 (in % of the total of 652 groups)

Source: Fischer [DRG-Systeme, 2000]: 80.

## 6.2 MS-DRG – Medicare Severity-Diagnosis Related Groups

A refinement of HCFA-DRG system in the shape of the SRDRGs was proposed as early as 1994. The new system was then introduced in 2007/08 as MSDRG system. It basically consists of a re-calculated SRDRG system, which is a DRG system using three severity grades, but only one general CC list and one general MCC list. The most severe secondary diagnosis determines the severity level; all other secondary diagnoses have no influence on the MSDRG assignment.

The 2008 system consists of 745 MSDRGs (defined within 335 base MSDRGs). Corresponding to Medicare's target population, the MSDRG system is a DRG system that reflects treatments offered to patients of over 65 years of age.

## 6.3 IAP-DRG – International All Patient Diagnosis Related Groups

Developed by 3M for Europe

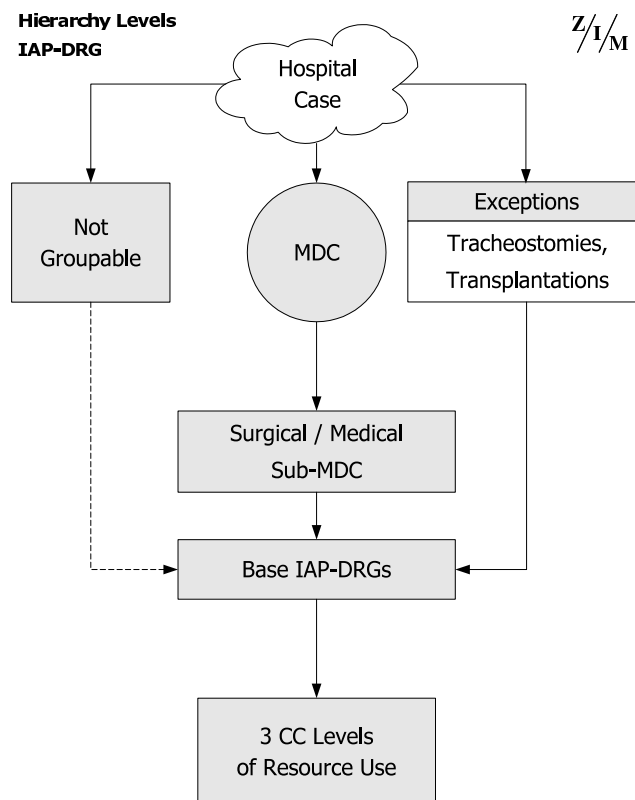
The IAP-DRG system was developed by 3M as a successor of the AP-DRG system with a special regard to the European market. On the one hand, it allowed for non-American coding systems to be integrated, too. On the other hand, the groups were partly adapted to European practice.

Base IAP-DRGs were defined and split end-to-end into three severity grades. The so configured system comprised 1046 IAP-DRGs (within 348 base IAP-DRGs).

Renamed as **IR-DRG**  
↑ p. 22

In 2000, the IAP-DRG system was renamed "International Refined Diagnosis Related Groups" (IR-DRG).

**Table 17:**  
Hierarchical levels of  
IAP-DRG



Source: Fischer [DRG-Systeme, 2000]: 84.

## 6.4 IR-DRG – International Refined Diagnosis Related Groups

The IR-DRG system was originally called IAP-DRG system.

In its second, completely recasted version of 2004, additional IR-DRGs for outpatient care were defined. Yet, these were not systematically subdivided towards severity level anymore, and they were only partially consistent with the inpatient base IR-DRGs.<sup>35</sup>

In surgical treatments, each Major Diagnostic Category was now defined based on the main procedure (and thus not anymore determined by the principal diagnosis). Hence, the name "DRG" (i. e. "diagnosis *related* groups") was – strictly speaking – not correct anymore.<sup>36</sup> Also, the MDC structure that existed since the beginning was tightened. Instead of 27, only 23 Major Diagnostic Categories were left.

In the 2006 version, a number of 1175 IR-DRGs are defined, of these 789 are for inpatient stays (within 263 base IR-DRGs) and 372 for outpatient treatments. 14 IR-DRGs are used to differentiate cases that are not groupable.

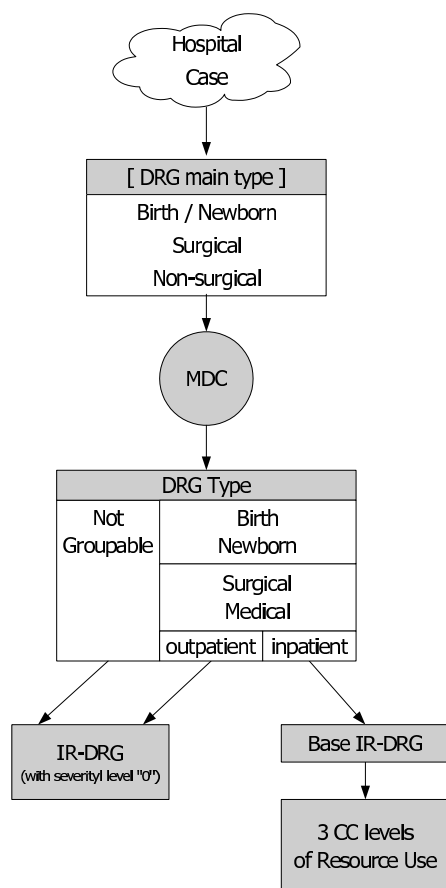
↑ p. 21

2<sup>nd</sup> version completely recasted

Procedure related  
definition of surgical  
Sub-MDCs

<sup>35</sup> Berlinguet et al. [IR-DRG, 2007].

<sup>36</sup> Until this time, procedure-driven MDCs had existed in HRG and LDF systems. – Cf. also Fischer [«DRGs» und DRGs, 2007].



**Table 18:**  
Hierarchical levels of  
IR-DRGs Version 2  
(March 2004)

Source: Fischer [Paarweise PCS-Vergleiche, 2005]: 13.

## 7 Alternative Systems (1): Multiple grouping

In this chapter you will find brief information on the following systems:

1. Short Info: Disease Staging (USA)
2. Short Info: PMC (USA)
3. Short Info: »mipp« (Switzerland)
4. Short Info: SQLape (Switzerland)

### 7.1 Disease Staging

Physicians as experts

The development of the D.S. system<sup>37</sup> began in the late 70s, at about the same time as DRGs (Diagnosis Related Groups). Unlike in the case of DRGs, the D.S. concept is based on a purely *medical expert approach*, and not upon statistical considerations.

Diseases

The system describes "diseases". Each disease is considered to run through various "stages". Inspired from the disease staging concept known in oncology, medical consultants have defined stages for 372 *clinical conditions*. In addition, 224 *categories for not specifically defined conditions* are present (e. g. "other malignant neoplasms of the circulatory system", "not otherwise specified heart diseases", "unspecified heart diseases" etc.).

Stage of disease

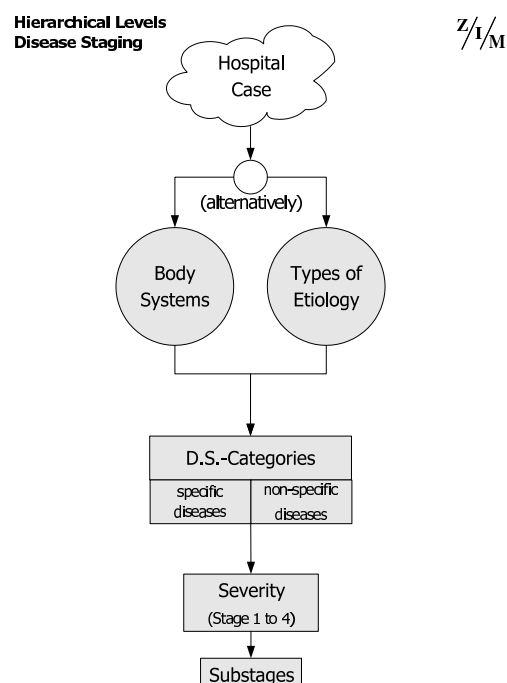
The disease stage is derived from all the diagnoses that were collected during the hospital stay of a patient. It is related to the mortality risk or the risk of retaining a disability from the disease. The treatment intended is not considered. (This allows for clear distinction between patient problems and therapy characteristics!)

The stages are as follows:

- Stage 1: A disease with no complications.
- Stage 2: The disease has local complications. (The problem is limited to an organ or body system; there is a significantly increased risk of complications.)
- Stage 3: The disease involves multiple sites, or has systemic complications. (Prognosis is bad.)
- Stage 4: Death (occurred during the hospital stay).

<sup>37</sup> Gonella et al. [DS-ClinCrit, 1994]; Gonella et al. [Disease Staging, 1984].

**Table 19:**  
Hierarchical levels of  
Disease Staging



Source: Fischer [DRGs im Vergleich, 1999]: 46.

Often, the D.S. system was used to demonstrate inhomogeneity of DRGs. This task is facilitated through the D.S. system's software, using a special index: The "DRGSCALE" figure shows, how much the cost weight of an individual hospital stay deviates from the DRG-related average value.

Differentiating DRG cost weights

## 7.2 PMC – Patient Management Categories

The PMC system<sup>38</sup> is an American competition model to the DRG systems, developed during the 80s. This system assigns not just one, but several disease categories to any individual hospital stay, if necessary. All diagnoses are considered without any ranking (unlike in most DRG systems where only the first, so-called "principal diagnosis", is relevant).

One or more than one PMC per case

However, since not each diagnosis describes a unique clinical condition, 54 disease/disorder modules have been defined (e. g. appendicitis, vascular disorder, delivery, lung neoplasm etc.). From each selected module, the PMC best reflecting the severity of the respective disease is assigned to the hospital stay.

54 disease/disorder modules

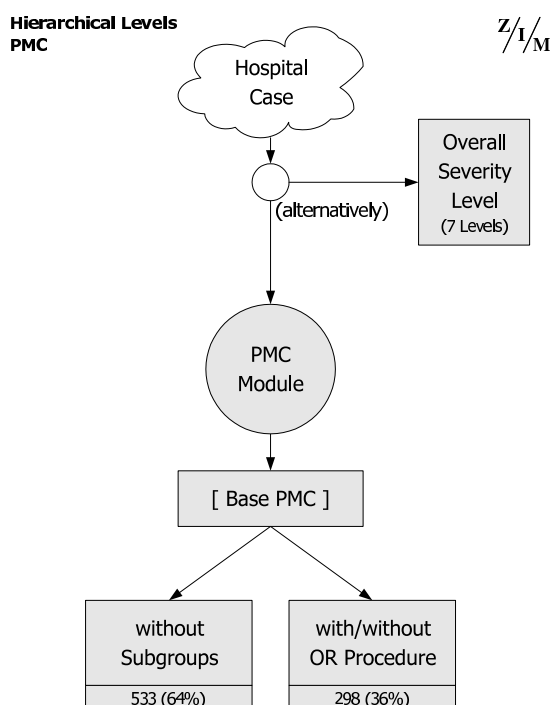
This approach allows for the following severity concepts to be considered:

Severity concepts

- *Multi-morbidity* (several organs/body systems affected) is represented by assignment of PMCs from different modules.
- The representation of *severity within an individual disease* (disease stage) is done by assigning defined diagnosis combinations belonging to the same disease to different PMCs within the same corresponding module.<sup>39</sup>
- In addition to the above, an *aggregated severity level* of all clinical conditions for each hospital stay is represented by means of a seven-step severity level indicator.

<sup>38</sup> PRI [PMC-Rel.5, 1993].

<sup>39</sup> For example, the PMCs for acute myocardial infarction with increasing severity are: uncomplicated, with tachyarrhythmia, with bradyarrhythmia/heart block, with hypertension with congestive heart failure with operation, with congestive heart failure without operation, with cardiogenic shock, with cardiac catheterization/PTCA.



**Table 20:**  
Hierarchical levels of PMCs

Numbers = count of groups in version 5.0 (in % of the total of 831 groups)

Source: Fischer [DRGs im Vergleich, 1999]: 47.



- Additional patient conditions defined by nurses could be integrated into the PMC model as an extension to the existing system: additional nursing related modules could be created.

Calculation of cost weights by means of patient management paths

Assignment of several patient categories to a single hospital stay implies some difficulties as well: Since a patient presenting two diseases is admitted only once, reference costs (or cost weights, respectively) from the individual patient categories cannot be simply added to obtain a *total cost weight* for the said hospital stay.

The PMC's solution to this problem is as follows: For each PMC, a typical *patient management path* was elaborated. For each step in treatment contained in this pathway, individual cost weights are calculated. When more than one PMC is eligible for the same hospital stay, the total cost weight is computed aligning all corresponding patient management paths and taking from these the highest given cost weight for each treatment step.

### 7.3 »mipp« – Modell integrierter Patientenpfade (Switzerland)

»mipp«

The "Model of Integrated Patient Pathways" was developed by the Aarau Cantonal Hospital (KSA). Since 1995, clinical pathways are jointly developed by physicians and nurses using this method<sup>40</sup> which was inspired by the PMC model.<sup>41</sup> The initial starting point for these works was the calculation of standard case costs. For this purpose, clinical guidelines, nursing data (based on the LEP system<sup>42</sup>), and accounting system data were gathered and compiled into standardized pathways of specified clinical conditions or therapeutic procedures while applying a consensus process. Meanwhile, this undertaking emerged into an important interdisciplinary project, which allows for optimization of both quality and costs.

Patient's pathway

A clinical pathway – called "patient's pathway" in »mipp« – consists of the list of all services rendered in relation to a given treatment as defined in the hospital's own clinical guidelines.<sup>43</sup>

Cost calculation

Each service has its specific cost value attributed, allowing for standard costs of the pathways to be calculated.

In addition, certain quality parameters are defined for each pathway, which are considered and verified either continuously, or merely on interest.<sup>44</sup>

Pathway components

Pathways are structured hierarchically. The elements of pathways are called *components*. Examples are: "visit in day-clinic, in laparoscopic surgery", or "emergency admission, nursing, in cholecystitis".

Partial pathways

A pathway can be divided into several partial pathways. These then represent different therapeutic processes that are (to an estimated degree) likely to be administered to the patient.

Service units

In turn, each component is divided into individual service units. The LEP system<sup>45</sup> was used to describe the nursing service units.

When developing these service units, it turned out that some of the services do not occur in all, but only in a given number of cases. A flexible solution was then found for this problem: These services were weighted by an occurrence probability factor.<sup>46</sup>

<sup>40</sup> Rieben et al. [Pfadkostenrechnung, 2003]; MIPP [Fallpreispauschalen mit »mipp«, 2001]; <http://www.mipp.ch/>.

<sup>41</sup> PRI [PMC-Rel.5, 1993].

<sup>42</sup> LEP = "Leistungserfassung in der Pflege" (LEP). – Brügger et al. [LEP-Methode 2.0, 2002].

<sup>43</sup> In Switzerland, the term hospital-own *standards* is used often instead of hospital-own guidelines.

<sup>44</sup> Examples of continuously evaluated parameters in laparoscopic cholecystectomy (CE) are e. g.: switch to open-surgery CE, length of stay, number of diagnostic investigations ordered during the post-operative stage.

<sup>45</sup> Brügger et al. [LEP-Methode 2.0, 2002].

<sup>46</sup> It was established, for example, that out of all laparoscopic cholecystectomies (CE) performed at KSA, a resting electrocardiogram (ECG) was performed and evaluated in only 10 % of the cases; or that 20 % of patients who underwent laparoscopic CE vomited after surgery in the wake-up room. – In the surgery ward, emergency patients with cholecystectomy in cholecystitis receive as a standard three injections, plus five infusions (to be prepared and connected). In addition, around 30 % of all patients receive an intravenous injection (e. g. as pain medication). – Approx. 80 % of patients have to be assisted during toileting, the remaining 20 % do not.

## 7.4 EfP – Efeuillage Progressif (France)

The french institute PERNNS ("Pôle d'expertise et de référence national des nomenclatures de santé"), that also developed the GHM system, has proposed a model which could improve the GHM representation of the spectrum of patients.<sup>47</sup> It suggested abolishing the CC levels (CMA, CMAS, age) and in turn assigning one or several base GHMs ("GHM élémentaires") to each case. The cost weights would then not be calculated as arithmetic averages, but rather using multivariate statistical procedures.

"Progressive Defoliation" (EfP)

The grouping is to be done similar to peeling an onion. Initially, a first base GHM is defined using the decision tree of the GHM classification. Then all diagnoses and procedures that belong to this GHM are eliminated. The remaining items are hierarchised, and the grouping process is repeated to determine the second GHM. And so forth. GHMs that are coming up repeatedly have to be bundled, and mutually excluding GHMs have to be defined. The number of GHMs per treatment case could be limited, if needed. Cost weights could be calculated based on the pre-existing data of 1996 and 1997, with the aim to establish a coefficient matrix that allows for easy calculation of the cost weight of each case.<sup>48</sup> – This method was called "Progressive Defoliation" ("Efeuillage Progressif" = EfP).

First tests revealed that the variance reduction related to costs improved by approx. 10 % up to about 49 % (excluding sameday cases), while only approx. 370 GHMs (instead of 506) were used.

The system never went beyond its test stage.

Test system

## 7.5 SQLape – Striving for Quality Level and Analysis of Patient Expenditures (Switzerland)

SQLape was developed in Western Switzerland by Yves Egli, and is available in an operational version since 2005. Compared to the established DRG systems, the SQLape system uses a different classification concept. As in DRG systems, only one cost weight results for each hospital stay. Yet the SQLape system functions with a number of patient groups which is clearly lower than the number of DRGs in DRG systems, that is to say with only about 350 SQLape categories compared with 640 to more than 1200 DRGs. This is possible because only treatments and diseases are represented by SQLape categories but not severity degrees. Instead of severity categories (e. g. DRGs with or without CC) more than one SQLape category can be assigned to one hospital stay. Furthermore, the main diagnosis does not decide the attribution of a primary patient category, but it is used the same way as all secondary diagnoses.

Multiple SQLape categories per case

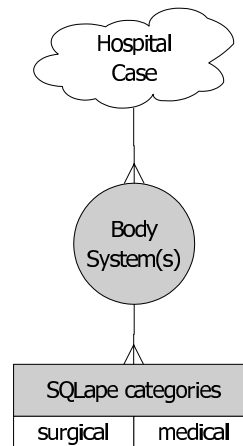
If a hospital case is assigned to several SQLape categories, the system marks the first group assigned following the the grouping hierarchy as "primary" SQLape category.

"Primary" SQLape categories

<sup>47</sup> Cf. Girardier et al. [EfP, 1999]; Blum [EfP, 2000]; Girardier [EfP, 2000].

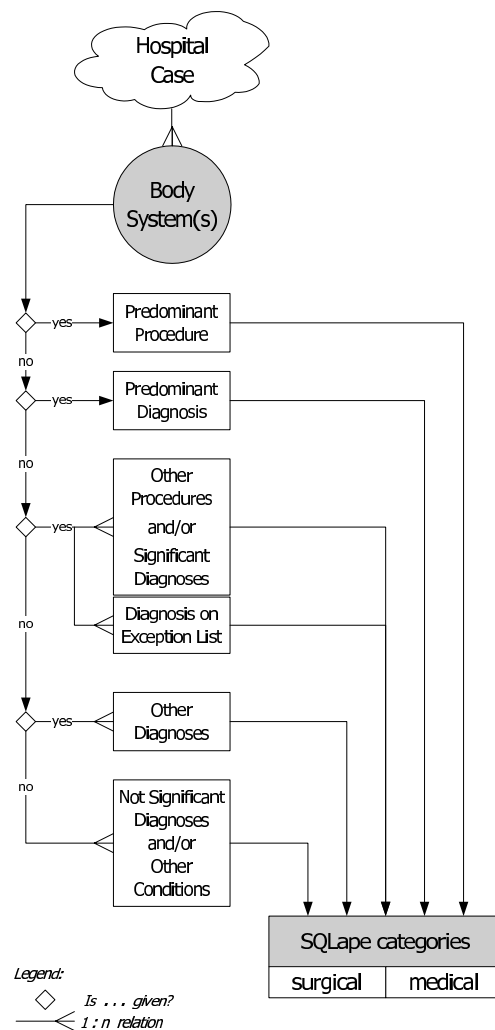
<sup>48</sup> In addition to its existing cost weight, a "sensitivity coefficient" is allocated to each GHM which is used whenever a GHM is present as primary GHM, as well as a "complexity coefficient" which is applied whenever the GHM is present as secondary GHM. Thus, the case is weighted using the cost weight of the primary GHM, and the complexity coefficients of secondary GHMs which are taken into account in function of the sensitivity coefficient of the primary GHM. – Email dated 2000-03-01 from M. Arenaz, PMSI. – Cf. also: Patris [EfP/coûts, 2000] and Patris [EfP, 2001].

**Table 21:**  
Hierarchical levels of  
SQLape



Source: Fischer [Paarweise PCS-Vergleiche, 2005]: 13.

**Table 22:**  
Assignment of SQLape  
groups to a case



Source: ZIM.

## 8 Alternative Systems (2): Episode-related Systems

In this chapter you will find brief information on the following systems:

1. Short Info: HBG (UK)
2. Short Info: DBC (Netherlands)

### 8.1 HBG – Health Benefit Groups (UK)

In the mid 90s, work on the development of a superordinate system named HBG (Health Benefit Groups) was started. It was designed as an (exclusively) diagnose-related system to reflect therapeutic needs. It was inter-connected to the HRG system, which unlike the HBGs reflects therapeutic services.<sup>49</sup> However, development was ceased meanwhile.

Health Benefit Groups  
(HBG)

### 8.2 DBC – Diagnose-Behandeling-Combinaties (Netherlands)

A DBC describes a treatment episode from the first contact with the patient and formulation of his/her chief complaint ("zorgvraag" in Dutch) until the last check-up (including those related to rehabilitation services). This trans-sectoral approach thus comprises not only stationary, but also ambulatory (outpatient) care. A patient can be treated within several DBCs at the same time.<sup>50</sup>

The decision to introduce DBCs was taken in the year 2000; as of 2005-01-01 complete data has been consistently collected and used for financing purposes.<sup>51</sup>

By 2006, about 29,000 DBCs had been defined and classified within 600 homogenous cost groups.<sup>52</sup>

There are two DBC lists. DBCs on list "A" have fixed prices. For DBCs contained in list "B", prices can be negotiated, bearing in mind that maximum production have to be agreed upon.<sup>53</sup>

<sup>49</sup> Fischer [PCS, 1997]: 281–284.

<sup>50</sup> For information on development and architecture of DBCs see: Westerdijk et al. [DBC structures, 2003] or Westerdijk/Ludwig [DBC structures, 2002]. – A comparative analysis with "conventional" DRG systems, and especially with the IR-DRG system can be found in: Welvaarts et al. [DBC, 2003].

<sup>51</sup> HOPE [DRGs in EU, 2006]: 34.

<sup>52</sup> HOPE [DRGs in EU, 2006]: 30. For 2007, the website dbconderhoud.nl indicated around 29,000 DBCs.

<sup>53</sup> HOPE [DRGs in EU, 2006]: 42+64.

## 9 Abbreviations and References

### 9.1 Abbreviations used

**Table 23:** Abbreviations used

Abbreviation	Label	Reference
AN-DRG	Australian National Diagnosis Related Groups	<a href="http://www.health.gov.au/internet/main/publishing.nsf/Content/health-casemix-ardrg1.htm">http://www.health.gov.au/internet/main/publishing.nsf/Content/health-casemix-ardrg1.htm</a>
AP-DRG	All Patient Diagnosis Related Groups	<a href="http://www.fischer-zim.ch/text-pcssa/t-ga-E4-System-AP-0003.htm">http://www.fischer-zim.ch/text-pcssa/t-ga-E4-System-AP-0003.htm</a>
APDRG-CH	Verein APDRG-Schweiz	<a href="http://www.apdrgsuisse.ch/">http://www.apdrgsuisse.ch/</a>
APR-DRG	All Patient Refined Diagnosis Related Groups	<a href="http://solutions.3m.com/wps/portal/3M/en_US/3M_Health_Information_Systems/HIS/Products/APRDRG_Software/">http://solutions.3m.com/wps/portal/3M/en_US/3M_Health_Information_Systems/HIS/Products/APRDRG_Software/</a>
AR-DRG	Australian Refined Diagnosis Related Groups	<a href="http://www.health.gov.au/internet/main/publishing.nsf/Content/health-casemix-ardrg1.htm">http://www.health.gov.au/internet/main/publishing.nsf/Content/health-casemix-ardrg1.htm</a>
CC	Comorbidity or Complication	
CCC	Catastrophic Comorbidity or Complication	
CCL	Complication and Comorbidity Level	
CMS-DRG	Diagnosis Related Groups der Medicare-Versicherung	<a href="http://www.cms.gov/AcuteInpatientPPS/">http://www.cms.gov/AcuteInpatientPPS/</a>
DkDRG	Dänische DRG	<a href="http://www.sum.dk/Sundhed/DRG-systemet.aspx">http://www.sum.dk/Sundhed/DRG-systemet.aspx</a>
DBC	Diagnose-Behandeling-Combinaties	<a href="http://www.dbconderhoud.nl/">http://www.dbconderhoud.nl/</a>
DPC	Diagnosis Procedure Combinations	
DRG	Diagnosis Related Groups	<a href="http://www.fischer-zim.ch/textk-pcs/index.htm">http://www.fischer-zim.ch/textk-pcs/index.htm</a>
D.S.	Disease Staging	<a href="http://www.schellen.com/59-0-Disease-Staging.html">http://www.schellen.com/59-0-Disease-Staging.html</a>
EfP	Effeillage Progressif	<a href="http://www.fischer-zim.ch/textk-pcs/t-G4-drg-fam-EfP-0801.htm">http://www.fischer-zim.ch/textk-pcs/t-G4-drg-fam-EfP-0801.htm</a>
FP	Fallpauschale[n]	
G-DRG	German Diagnosis Related Groups	<a href="http://www.g-drg.de/">http://www.g-drg.de/</a>
GHM	Groupes homogènes de malades	<a href="http://www.atih.sante.fr/">http://www.atih.sante.fr/</a>
GHS	Groupes homogènes de séjours	<a href="http://www.atih.sante.fr/">http://www.atih.sante.fr/</a>
HBC	Homogén Betegség-Csoportok	<a href="http://www.gyogyinfok.hu/magyar/prog_archiv.html">http://www.gyogyinfok.hu/magyar/prog_archiv.html</a>
HBG	Health Benefit Groups	
HCFA-DRG	Diagnosis Related Groups der Health Care Financing Administration	<a href="http://www.fischer-zim.ch/text-pcssa/t-ga-E1-System-HCFA-0003.htm">http://www.fischer-zim.ch/text-pcssa/t-ga-E1-System-HCFA-0003.htm</a>
HRG	Healthcare Resource Groups	<a href="http://www.ic.nhs.uk/services/the-casemix-service">http://www.ic.nhs.uk/services/the-casemix-service</a>
HRG4	Healthcare Resource Groups 4	<a href="http://www.ic.nhs.uk/services/the-casemix-service/new-to-this-service/healthcare-resource-groups-4-hrg4">http://www.ic.nhs.uk/services/the-casemix-service/new-to-this-service/healthcare-resource-groups-4-hrg4</a>
IAP-DRG	International All Patient Diagnosis Related Groups	<a href="http://www.fischer-zim.ch/text-pcssa/t-ga-E7-System-IAP-0003.htm">http://www.fischer-zim.ch/text-pcssa/t-ga-E7-System-IAP-0003.htm</a>
IR-DRG	International Refined Diagnosis Related Groups	<a href="http://multimedia.mmm.com/mws/mediawebserver.dyn?6666660Zjcf6lVs6EVs66SHOBCOrrrrQ-">http://multimedia.mmm.com/mws/mediawebserver.dyn?6666660Zjcf6lVs6EVs66SHOBCOrrrrQ-</a>
LEP	Leistungserfassung in der Pflege	<a href="http://www.lep.ch/">http://www.lep.ch/</a>
LDF	Leistungsbezogene Diagnosen-Fallgruppen	<a href="http://www.bmg.gv.at/home/Schwerpunkte/Krankenanstalten/">http://www.bmg.gv.at/home/Schwerpunkte/Krankenanstalten/</a>
MCC	Major Comorbidity or Complication	
mipp	»mipp«	<a href="http://www.fischer-zim.ch/streiflicht/KSA-9509.htm">http://www.fischer-zim.ch/streiflicht/KSA-9509.htm</a>
MS-DRG	Medicare Severity-Diagnosis Related Groups	<a href="http://www.cms.gov/AcuteInpatientPPS/">http://www.cms.gov/AcuteInpatientPPS/</a>
NordDRG	Nordic Diagnosis Related Groups	<a href="http://www.nordcase.org/">http://www.nordcase.org/</a>
PCCL	Patient Clinical Complexity Level	
PMC	Patient Management Categories	<a href="http://www.fischer-zim.ch/streiflicht/PMC-9511.htm">http://www.fischer-zim.ch/streiflicht/PMC-9511.htm</a>
RDRG	Refined Diagnosis Related Groups	<a href="http://www.fischer-zim.ch/text-pcssa/t-ga-E3-System-RDRG-0003.htm">http://www.fischer-zim.ch/text-pcssa/t-ga-E3-System-RDRG-0003.htm</a>
SCC	Severe Comorbidity or Complication	
SE	Sonderentgelt[e]	
SQLape	Striving for Quality Level and Analysis of Patient Expenditures	<a href="http://www.sqlape.com/">http://www.sqlape.com/</a>
SR-DRG	Severity-Refined Diagnosis Related Groups	<a href="http://www.fischer-zim.ch/text-pcssa/t-ga-E6-System-SR-0003.htm">http://www.fischer-zim.ch/text-pcssa/t-ga-E6-System-SR-0003.htm</a>
SwissDRG	Swiss Diagnosis Related Groups	<a href="http://www.swissdrg.org/">http://www.swissdrg.org/</a>

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