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### Diagnosis Related Group (DRG) Funding for intensive care

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#### Author

**Akos Csomos, MD, DEAA, PhD**

*Surgical Intensive Care Unit*

*Semmelweis University,*

*Budapest, Hungary*

Diagnosis Related Group (DRG) is by definition, a case mix classification scheme, which was designed in the 1960s to evaluate hospital performance. It was then adopted some 20 years later as a base unit of payment in the Medicare system in the United States (Inglehart, 1983). There were 467 DRG categories in its original form and these were defined by diagnosis, procedure and patient age information from a nationally representative sample of discharge records. Groups were intended to be clinically similar and to require similar amounts of hospital resources. To construct a hospital-specific index, the frequency of cases in each DRG was multiplied by a cost weight. These weights were constructed by converting the mean charge per DRG to cost. In theory, as it can be found in the report to the Congress (Schweiker, 1983), "hospitals can keep any surpluses they achieve, [...] physicians can be expected to compete with each other for available resources," and the authors also hoped that "cost-ineffective practice patterns will be discouraged".

Has the DRG funding proven its advantages over the years? No, it has not. That is why there are no countries in Europe at present, which use solely DRG funding for intensive care. The major inaccuracies were highlighted even after its introduction in 1983, as the President of the Association of American Medical Colleges was left with three major concerns (Inglehart, 1983):

1. Lack of sensitivity of the DRGs in measuring differences between patients;
2. Inaccuracies resulting from the use of average cost and average prices;
3. Appropriate recognition of and payment for teaching hospitals.

Why don't we want to use DRGs alone in intensive care? Let's just discuss the three "ageing" basic concerns outlined above. First, DRGs are designed for acute inpatient hospital care and the purpose is to group those patients who are similar clinically and who have a similar pattern of resource use. A large number of DRGs, however, do not describe resource use well and the average cost of treating a patient in any given DRG is higher for hospitals with than for hospitals without ICUs (Cooper and Linde-Zwirble, 2004). Second, the average price for the average patient does not exist in the ICU; there are outliers, who cost disproportionately more than average. The study by Cooper (2004) shows this in a large database, involving 55.8% of all intensive care unit days for one year in the USA (Table 1)(Cooper and Linde-Zwirble, 2004).

Finally, teaching hospitals are expensive places to treat patients. The higher cost of care has been attributed to a more complex case mix, the use of more sophisticated technology and the "legitimate" extra cost of teaching, which is not taken into account by DRG (Aardal et al. 2005).

Can the DRG funding be improved? Yes, it is possible to make it better by several different methods, including:

- Entering correct medical records. In a Norwegian study, the quality of medical records was checked in the authors' ICU (Neilson et al. 2004). They performed a retrospective analysis of submitted DRG codes in a year and found that an additional 18.4% DRG points could be retrieved, which corresponds to €1.1 million!
- Identifying the outliers. It is well known that extended length of stay (LOS) significantly contributes to the ICU costs (Neilson et al. 2004). In order to improve DRG, we should try to identify the factors, which can predict prolonged LOS in the ICU. Higgins et al (2003) analysed 12 variables against weighted LOS (n= 10,862) and found that mechanical ventilation and presence of infection on admission prolongs LOS.
- Taking into account other high cost drivers such as direct nursing hours, number of organ failures, expensive medications, certain procedures, etc. This will encourage us to concentrate on the individual differences between ICUs, which an ideal funding system should also take into account. Of course, this can only be done if detailed costing data is available.

What is the future of DRG in intensive care? DRG funding will only work if country-specific adjustments are made, depending on the structure of the healthcare system and the intensive care settings. In France, for example, DRG is combined with the activity-driven funding. This incurs

additional funding for procedures performed in the ICU (Guidet et al. 2006). In Germany, however, a simplified Therapeutic Intervention Scoring System (TISS- 28) is used for ICU funding in combination with DRG (Neilson et al. 2004). The continuing demand for intensive care combined with limited budget for healthcare expenditures will motivate us further to look for the ideal funding of intensive care.

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