

HERCA-DAP display proposal

(Approved on the occasion of the 10th HERCA Meeting, 31 October 2012)

In radiography and fluoroscopy the dosimetric quantity which is easy to get (by measurement or calculation) is the Dose Area Product (DAP) also named Kerma Area Product (KAP). In computed tomography CTDIvol and Dose Length Product (DLP) are requested by an IEC standard which specifies the units: CTDIvol in mGy and DLP in mGy.cm. So whatever the manufacturer or the system the user gets systematically the same dosimetric information with the same unit.

In radiology performances and testing of DAP meters with ionization chambers are also specified in an IEC standard where the SI unit are specified for DAP is Gy.m². SI prefixes are also permissible so different units are in use (Gy.cm², dGy.cm², cGy.cm², μGy.m² or mGy.cm²) depending on DAP or X-ray equipment manufacturer. Some units are equivalent such as cGy.cm² and μGy.m² but the conversion factor can reach 1000 such as between Gy.cm² and mGy.cm².

To avoid misinterpretation of the DAP information; it is essential that the value displayed is readily understood by the user who may be working with many other X-ray equipments from various manufacturers in different places.

For ease of interpretation of dosimetric data, it is desirable that the DAP unit is:

- the same for the same domain of use, i.e. general radiography and interventional radiology;
- suited to the range of doses delivered depending on domain, including paediatrics procedures.

**The HERCA WG MA proposes to use as DAP unit:
Gy.cm² for interventional radiology and mGy.cm² for general radiography.**

EFOMP (in May 2012) has recommended respectively Gy.cm² and cGy.cm². In UK, to allow flexibility at a local level, it is recommended that each X-ray room is set to the same display value in a department but this display setting shall be either Gy.cm² or cGy.cm².

To be consistent with other units of dosimetric quantities used in radiology (skin dose in mGy, CTDIvol in mGy, DLP in mGy.cm) and to avoid introducing a new SI prefix, WG MA proposes mGy.cm² instead of cGy.cm². Moreover mGy.cm² allows sufficient precision for paediatrics examinations (table 1).

Table 1: Order of magnitude of DAP values in radiology

General radiography	DAP (mGy.cm ²)	Interventional radiology	DAP (Gy.cm ²)
Chest (AP) new born	10	Pacemaker	7
Panoramic radiograph - child	56	Coronarography	40
Chest PA	250	PTCA	45
Cervical spine (A or P)	750	Diagnostic cerebral arteriography	150
Pelvis (AP) or Abdomen	7000	Cerebral aneurysm embolisation	250
		Uterine artery embolisation	300