

# Practical FDG Imaging: A Teaching File

D. Delbeke, W.H. Martin, J.A. Patton, and M.P. Sandler, eds.

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After the introduction of the whole-body scan mode in the early 1990s and of the combined PET/CT scanner at the end of that decade, PET, using  $^{18}\text{F}$ -FDG as the principal radiopharmaceutical, has become a booming business, especially as a diagnostic tool in oncology. The fact that reimbursement became available also played an important role in this development. And today we see an ever-increasing number of centers and departments installing a PET or a PET/CT camera. There are, however, some important backdrops to this revolutionary expansion, not the least being a lack of well-trained PET specialists. Both the Society of Nuclear Medicine and its European counterpart, the European Association of Nuclear Medicine, have recognized this danger and have started to organize regular courses about PET or, specifically,  $^{18}\text{F}$ -FDG PET. Delbeke et al., from Vanderbilt University in Nashville, Tennessee, also recognized the danger and edited a book, of which the subtitle clearly defines their intentions: a teaching file. Their aim was "to provide a reference source of cases with FDG images obtained both on dedicated PET tomographs and hybrid scintillation gamma cameras. The cases are presented in depth so that they will be of value to both the specialist physician and the resident in training. . . ." Did they succeed?

The book is divided into 2 sections. The first, and shorter, section provides an overview about the history of PET, the physics of PET, and the production and distribution of  $^{18}\text{F}$ -FDG, concluding with 2 clinical chapters on neurologic and cardiologic applications. The second, and larger, section discusses different tumor types. Each chapter starts with a short summary of the  $^{18}\text{F}$ -FDG experience with that particular tumor type and ends with several case presentations. Most of the contributors are at the same institute as the editors, making the book predominantly the written record of a single center's experience with  $^{18}\text{F}$ -FDG PET.

The text is easily readable and understandable. However, the editing is not always consistent. In an effort to provide a readable and comprehensive overview, the editors have sometimes overlooked some statements that need further clarification. For instance, in the chapter on the physics of PET, the phrase *list mode* is introduced but not further explained, leaving the inexperienced reader confused. Only little attention is paid to lutetium silica oxide-based systems, although they are seen as an important future development. And the possibility of using the CT data from the PET/CT machine for attenuation correction is mentioned just briefly. I consider this use to be the major advantage of the combined PET/CT machine, since it reduces the time of the transmission scan from approximately

30 min to just 1 min, thereby allowing an enormous increase in patient throughput. And, not to be forgotten, shortening of the scan time is much more patient friendly. Finally, chapters on image reconstruction and the use of  $^{18}\text{F}$ -FDG in inflammation are lacking.

In contrast, the text is superfluous in other places; for example, the mechanism of  $^{18}\text{F}$ -FDG uptake is explained in several places. One would have preferred a single chapter explaining the principles of  $^{18}\text{F}$ -FDG imaging, patient preparation, normal distribution of  $^{18}\text{F}$ -FDG, and pitfalls. Also, rather more attention is paid to hybrid systems—conventional  $\gamma$ -cameras equipped with a thicker crystal and coincidence electronics—than is desirable. In my opinion this is a pity, since I consider these cameras remnants from a bygone era, and particularly so within the field of oncology.

The case presentations after each chapter are an important part of the book. The didactic idea behind these cases is good. However, I find 2 shortcomings. The first is the choice of cases. Most times, the cases are clear-cut examples. I would have preferred a more average selection, which would leave some room for the doubts we encounter in everyday practice. The second shortcoming is that the cases are presented in a style that gives no opportunity for interactive participation by the reader. The reader is not asked to read the images first, come up with a differential diagnosis, and then proceed, but is given all information immediately. Taking the subtitle of the book into account, this is a missed chance. The discussion of each case presentation partly compensates for this shortcoming, however, by providing a rapid overview of the clinical entity discussed and of the place of  $^{18}\text{F}$ -FDG PET in the diagnostic work-up.

Some final remarks: The book is very much oriented toward the situation in the United States. No insight is given on the situation in Europe or elsewhere. Yet the lack of a chapter on the cost-effectiveness of the methodology is strange, given the attention this topic has always had, and still has, in the United States. Finally, although the schemes are often quite clear, some of the photographs are of below-average quality.

Delbeke et al. have succeeded in creating a teaching book for those who have little knowledge of or experience with  $^{18}\text{F}$ -FDG. Despite some criticisms, the book is well suited as a starting point for gaining this knowledge about  $^{18}\text{F}$ -FDG imaging, particularly  $^{18}\text{F}$ -FDG PET.

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