We have developed a computational environment for radiotherapy research (CERR, pronounced ‘sir’). CERR partially addresses the following needs in treatment planning research: (a) it provides a common, convenient, and powerful software development environment to prototype treatment planning concepts, (b) it provides an integration environment for software written in multiple languages (Matlab, Fortran, C/C++, Java), (c) it can extract treatment plans from disparate planning systems by reading AAPM/RTOG archives, (d) outcomes data can be merged into the same Matlab ‘object’ with all the other plan data, and (e) it provides a convenient and powerful tool for sharing and reproducing treatment planning research results. CERR components can be run either as interpreted programs from within Matlab, or as executable stand-alone programs, apart from Matlab. Currently available functional components include: a program which converts all AAPM/RTOG archive information into a compact and easily manipulable Matlab cell-array data object; a graphics program which displays transverse computed tomography images, structure contours, and isodose lines; a dose-volume histogram/dose-surface histogram calculator/viewer. The user can easily retrieve any AAPM/RTOG keyword information about the treatment plan. Digital films can also be displayed. CERR provides a powerful, convenient, and common framework allowing researchers to compare and share research results for the same patient data, including software routines and optimized dose distributions. The current released version of CERR can be downloaded and used for non-commercial, non-clinical research, from the web page: castor.wustL.edu/~deasy/cerr/cerr_home.html.

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