

The Impact of Tim Planning on Workflow Initial Experience

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Introduction

MRI is the modality of choice for imaging many systemic and pathological conditions. In our practice it is becoming more and more common to see requests for whole body or multi-region exams to evaluate and monitor a number of disease processes. This is a challenge from a number of points of view. Although we are here primarily to provide a service to our referral base and patients, we also need to be able to integrate these cases into our daily practice in a timely manner. Examination times need to be kept short to maintain patient tolerance and aid in general workflow. The set up and planning of these studies also needs to be straight forward so image quality can be maintained over a wide range of patients and imaging technologists. In the past we have successfully carried out these examinations, but they have often been time consuming and in some cases involved several visits to the MRI centre. With the installation of our 1.5T Siemens MAGNETOM Avanto scanner, and the recent upgrade to software version *syngo* MR B13, a number of tools have become available to us that have allowed the easy integration of whole body scanning in our daily schedule and streamlining of our workflow.

Technical Considerations

The smooth integration of both hardware and software on the current Siemens Tim (Total imaging matrix) system has had an immediate impact on the planning and ease of implementation of a number of our whole body and multi-region scanning protocols. We have had access to the Tim system and the integrated Parallel Acquisition Techniques (iPAT) for a number of years, but the in-

roduction of several new software packages has streamlined the implementation of this whole process. The key elements include:

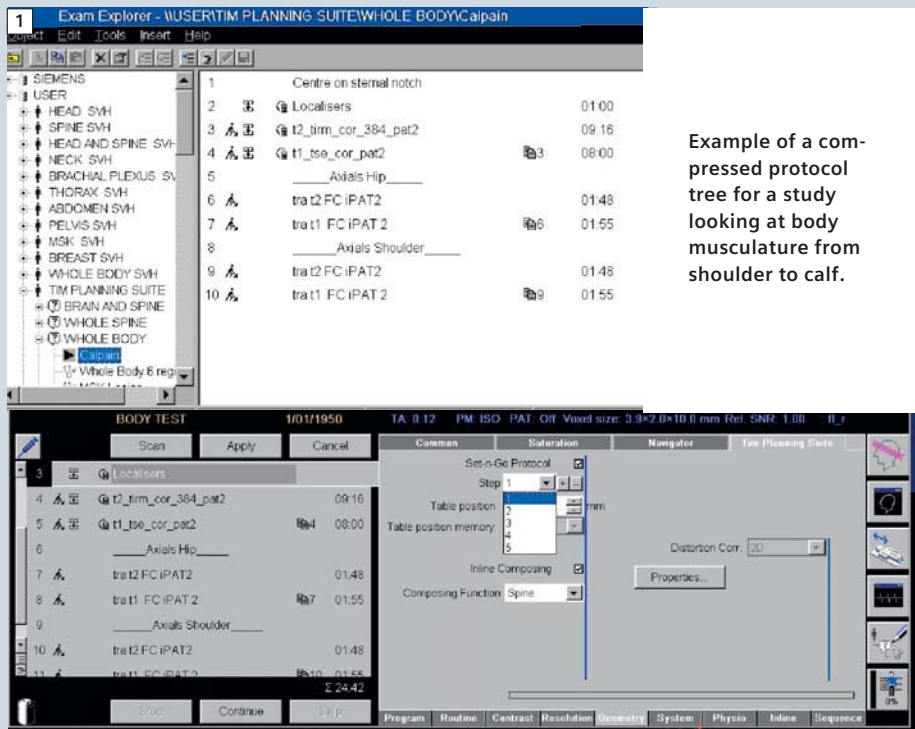
Tim Planning Suite

Set-n-Go protocols – this has allowed us to develop and save a number of streamlined protocols in a compressed protocol tree using the set-n-go function provided in this technique. Protocols range from whole spine to whole body exams and together with the Tim planning UI allows efficient planning of these studies.

Inline Composing: As the name sug-

gests this automatically stitches together multiple images to provide an extended view of the scanned area. This is particularly useful for scout images where an overall view can be taken of the whole body or spine for example, and subsequent imaging can then be planned over the area of interest. This ensures the region of interest is always covered, and multiple areas can be scanned with the minimal number of sequences and table moves to perform the examination.

Coupled Graphics: This allows all graphic prescriptions – sat pulses and sequences,



Example of a compressed protocol tree for a study looking at body musculature from shoulder to calf.

1 Localiser showing Set-n-Go protocol with 5 table positions.

to be grouped together and positioned and moved as a single unit. This is particularly useful for whole body scanning and multi-region angiography when we intend to display the end product as a composed image and maintain full coverage.

Scan at Center: This ensures all imaging is performed in the center of the bore, maximising homogeneity and shim for fat saturation techniques. This is especially important for large field of view studies and where multiple transverse sequences are required for our body and spine work. The above techniques have allowed us to develop and implement a number of multi-region imaging protocols into our daily practice. We believe the resulting protocols are efficient, provide good diagnostic results, and are able to be applied consistently by a number of technologists with varying skill levels. What has been in the past a time consuming and complex set of examinations has been greatly streamlined with a concomitant improvement in workflow and ease of application. The exams in which this technique has found constant use are:

1. Whole body screening for

- metastatic disease
- systemic disease

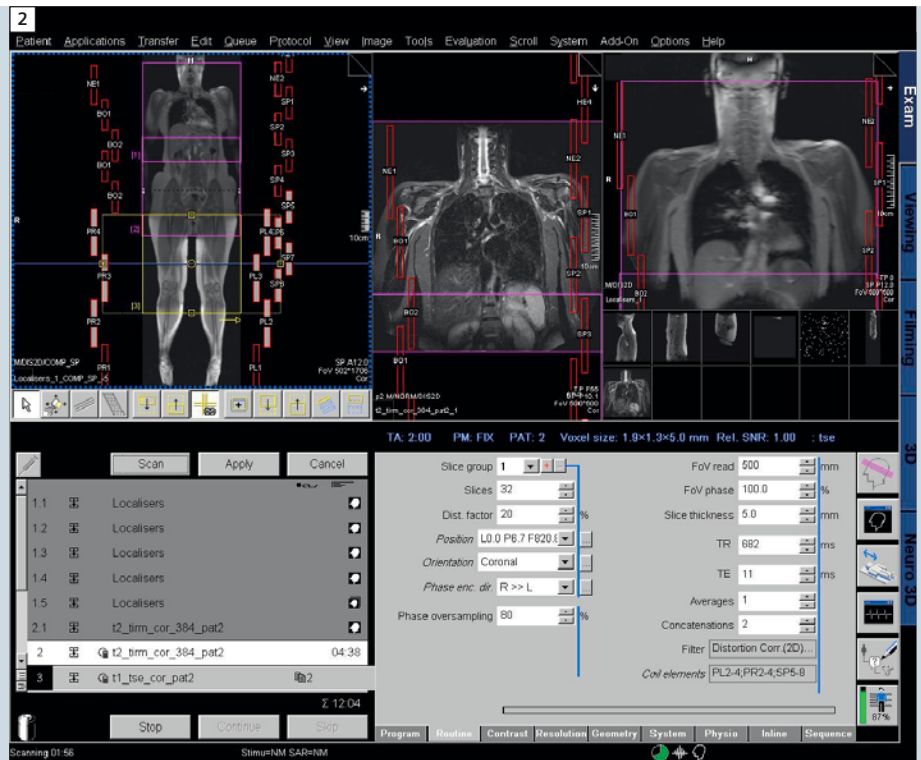
2. Neuro axis screening for

- primary investigation of pathology
- tumor staging / recurrence
- monitoring of disease progress e.g. MS
- primary investigation of idiopathic conditions

3. Multi area exams for

- multi-organ / system problems
- patients with multiple disease processes
- extensive MSK lesions

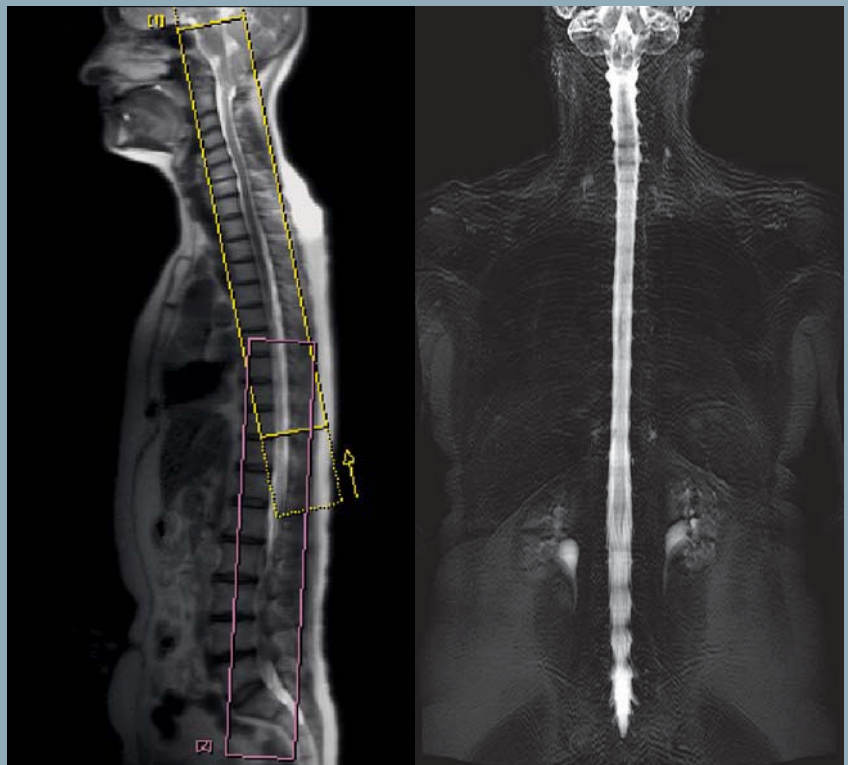
The Tim Planning Suite is now an integral part of all our multi-region examinations and provides both a technologist and patient friendly platform. We are now able to integrate these exams into our daily workflow in a time and cost efficient manner.



2 Tim Planning user interface (UI) showing composed scout image, coupled graphics, Auto-Coil Select, and scan@center all in use.

→ **Application Tip**

Planning of sagittal slices can be problematic on patients with degenerative spinal disease, scoliosis and kyphosis. In these cases we find a further scout image consisting of a single coronal HASTE slice, 50–70 mm thick, positioned over the spine at each level, yields a very nice myelographic image to allow the accurate planning of sagittal slices.



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