

Index

- 5-fluorouracil (5FU), 176, 181, 183, 184, 191
- acinar distortion and atrophy, 81
- acquisition parameters
 kidneys, 32–3, 46–7
 prostate, 77
- acquisition time, 19
- active surveillance, 80
- acute pancreatitis, 57–9, 62
- acute renal failure, 38, 39–40, 42
- adenomyosis, 119
- adnexal tumors, 133–5
- androgen ablation therapy, 80
- angiomyolipomas (AMLs), 47, 49
- animal models, 172, 208
 ADC measurements, 174–82
 ADC measurements in liver, 185–7
 tumor post-treatment changes, 182–5
 tumor treatment response, 175–6
- anisotropic diffusion, 2, 3, 35
- ankylosing spondylitis, 191
- annuli fibrosi, 156
- ANOVA, 192
- anti-death receptor 181
- apparent diffusion coefficient (ADC), 4, 9, 10, 46, 55
 across platforms, 198
 and measurement reproducibility, 202–4
 animal tumors, 174–82
 bone marrow/spine, 149, 153, 154, 155, 156
 breast, 87, 88, 90–1, 180
 cut-off value, 123, 129
 female pelvis, 123, 127, 128, 131
 focal renal masses, 51
 kidney transplants, 43–4
 kidneys, 34, 35, 37–8, 37–42, 46–7
 liver, 19, 21, 22–3, 23–4, 26, 185–7
 lymph nodes, 106, 107–9, 110
 measurement reproducibility, 203
 normalization, 112–14
 pancreas, 57, 59–60, 62–6
 prostate, 75, 76–7, 77–8, 79
 renal artery stenosis, 38–9
 renal failure, 39–40
 soft tissue tumors, 168
 soft tissues, 165, 166
 tumor tissue water, 182–5
 tumor treatment response, 25–7, 173, 175–88, 190
 ureteral obstruction, 40–1,
- apparent diffusivity, 74
- arterial spin labeling (ASL), 44
- axial diffusivity, 2
- axial scans, 33, 34
- axillary lymph nodal status, 103
- balloon coils, 74
- barium, 74
- BCNU, 172, 184, 191
- benign proliferative lesions, 91
- benign prostatic hypertrophy (BPH), 72, 73, 79
- benign soft tissue tumors, 166
- benign vertebral compression fractures, 144, 149, 150, 157
- biexponential diffusion fitting, 35, 44, 77–8
- bilateral sacroilitis, 191
- black blood diffusion images, 21
- BLADE, 148
- bleomycin, 182
- blood oxygen level-dependent (BOLD), 44
- bone marrow, 144–58, 145–55, 150–7
 DWI studies, 149–57
 DWI techniques, 144–9
 treatment response, 191
- BRCA2 mutation, 72
- brain MRI, 146
- brain tumors, 162, 163, 165
- breast, 86–99
 breast cancer, 86, 88, 89–98, 103, 104, 151
 ADCs, 90
 detection, 88
 diagnosis comparisons, 91–3
 future directions, 99
 treatment response, 93–7, 178–81, 187–9, 191, 192
 tumor staging, 91
- breast lesions, 86–7
 ADCs, 90
 characterization, 90–1
 detection, 88–9
 diffusion acquisition and processing, 87–8
- breath-hold imaging, 18, 19, 20, 21
 kidneys, 33, 34
 lymph nodes, 105
 pancreas, 56
 renal masses, 47
 bulk tumor necrosis, 164
- b*-values, 4, 5, 9
 and image standardization, 204
 animal tumors, 174
 bone marrow/spine, 149, 150, 153, 155, 156, 157
 breast, 87–8, 90
 female pelvis, 121, 122
 kidneys, 33, 35, 37–8, 46
 liver, 19–20
 lymph nodes, 108, 110
 optimization, 77
 pancreas, 57, 62, 66
 prostate, 76–7, 78
 soft tissues, 162, 166
 tumor treatment response, 175–88
- CA19–9, 55
- Cambridge score, 57
- cancer, 103
- cancer biomarker, 173
- capecitabine, 178
- carbon-ion radiotherapy (CIRT), 189
- carboplatin, 181
- carcinosarcomas, 129, 133
- cardiac motion, 185
- cardiac pulse triggering, 56
- Carr–Purcell–Meiboom–Gill (CPMG) condition, 7, 147
- cell density, 173, 177
- cellularity, 10, 91, 97, 128, 162, 163–4
- central nervous system, 172
- central zone, 72, 78, 79
- cerebral ischemia, 144
- cervical cancer, 112, 124, 129–30, 131, 134, 138, 140
- cervical lymphadenopathy, 107, 109
- cervix, 127, 128
- chemical shift artifacts, 87, 199
- chemical shift selective suppression (CHESS), 56, 88
- chemotherapy, 140, 174
- neoadjuvant chemotherapy

Index

- (NACT)chemotherapy (cont.)
 breast cancer, 178–81
 colon cancer, 178
 fibrosarcomas and myosarcomas, 174–8
 liver, prostate and other tumors, 181–2
 Na⁺ signal intensity and tissue water ADC, 182–5
- choline/citrate ratio, 82
 chronic pancreatitis, 57–9, 62
 chronic renal failure, 38, 39–40, 42
 cirrhosis, 10, 11, 21, 22, 23–5
 clinical trials, 208
 coil selection, 34–5, 174
 colon cancer, 104
 metastases, 25, 26
 treatment response, 178, 179, 191, 192
 colorectal hepatic metastases, 22, 25, 26
 combretastatin, 208
 combretastatin A, 177
 compression fractures, 144, 149, 150, 157
 computed tomography (CT), 104, 105, 112
 contrast medium, 129
 contrast medium enhancement, 136
 contrast-enhanced Fourier-acquired steady-state technique (CE-FAST), 148
 contrast-enhanced MDCT, 55, 57
 contrast-enhanced T1-weighted imaging, 48
 contrast-to-noise ratio, 107
 coronal scans, 32, 33, 35, 43
 cortex, 10, 12, 37, 38, 43, 112
 cryoablation, 81
 cyclophosphamide (Cp), 174, 176, 177, 182–3, 187
 cystadenocarcinoma, 136
 cystadenoma, 68, 69
 cystic degeneration, 164
 cystic glandular hyperplasia, 129
 cystic ovarian tumors, 133
 cystic pancreatic lesions, 64–9
 cysts, 10, 46
 kidney, 47–8
 cytotoxic edema, 191
- data analysis, 8–9
 data interpretation, 206–8
 depth of tumor invasion, 135–6
 dielectric cushion, 35
 diffuse renal diseases, 37–41
 diffusion, 55, 115, 174, 193
 water diffusion
 coefficient, 1, 2
- diffusion gradients, 3, 144, 148
 diffusion index, 178
 diffusion kurtosis imaging (DKI), 3
 diffusion length, 3
 diffusion NMR, 1–5
 diffusion sensitizing factor, 87
 diffusion tensor, 2, 5
 diffusion tensor imaging (DTI), 2, 6, 44, 200–1
 female pelvis, 119, 126
 kidneys, 12
 prostate, 201
 vs. standard diffusion, 35–6
 diffusion time, 3
 diffusion-weighted imaging (DWI), 1, 144
 body applications, 9–12
 data analysis, 8–9
 future directions, 198–208, 199–207
 pulse sequences, 5–8
 quantification, 35–6
 diffusion-weighted whole-body imaging (DWIBS), 105–7, 109, 112, 115, 144, 156, 206
 diffusion-weighting effect, 4, 5
 diffusional kurtosis, 2, 10
 diffusivity
 soft tissue tumors, 163–5
 dilated collecting system, 40
 distortion artifacts, 75, 87, 144, 146
 docetaxel, 180, 182
 double spin-echo technique, 199
 doxorubicin, 178
 ductal carcinomas, 89, 91, 97
 ductal ectasia, 91, 96
 dynamic contrast-enhanced MRI (DCE-MRI), 24, 82, 86, 91, 95, 119, 189
- echo-planar imaging (EPI), 5–7, 146–7, 162
 single-shot echo-planar imaging (SS EPI)drawbacks, 199
 echo-train length (ETL), 6, 35, 56, 146, 147
 eddy currents, 199, 202
 edema, 9, 10, 46, 130, 153, 191
 eigenvalues, 2, 8, 79
 eigenvectors, 2, 8
 endocervical adenocarcinomas, 130
 endometrial adenocarcinoma, 137
 endometrial cancer, 119, 126, 128, 129, 130, 131, 135
 endometrial cavity lesions, 129
 endometrial polyps, 129
 endometrial stromal sarcoma, 130
 endometrioid adenocarcinoma, 123, 129
- endometriomas, 134
 endometrium, 127
 endorectal MRI, 73, 74, 77
 endoscopic retrograde cholangiopancreatography (ERCP), 57
 endoscopic ultrasound (EUS), 55, 57
 end-stage renal disease, 41
 enhancement patterns, 86, 87
 enhancement ratio, 48
 epidermal cysts, 164
 epirubicin, 187
 esophageal cancer, 104, 111
 extracellular space (ECS), 173, 177, 185, 186
- false color maps, 121
 false-negatives, 104
 false-positives, 95, 139
 fast diffusion component, 80
 fast spin echo (FSE);
 single-shot fast spin echo (FSE)turbo-spin echo (TSE)
 fat saturation, 88, 154
 fat-suppression, 18, 21, 56, 88, 114, 200, 202
 at higher magnetic field, 202
 fatty tissue, 166
 female pelvic tumors, 119–40, 120–31
 clinical protocol, 120
 DWI clinical applications, 128–36
 DWI protocol, 121
 image display, 121
 image interpretation, 121–6
 nodal assessment, 138–9
 treatment response, 140
 female pelvis, 122–39, 126–8
 fetal kidneys, 38
 fiber tracking (FT), 9
 fibroadenomas, 93, 98
 fibrosarcomas, 174–8
 FibroScan, 23
 fibrosis, 10, 40
 liver fibrosisFick's law, 2, 4
 field of view (FOV), 32, 87
 field strength, 74–5
 fifth-dimensional (5D) imaging, 207
 fine-needle aspiration cytology (FNAC), 104
 first spin echo (SE1), 148
 first stimulated echo (STE1), 148
 FISP sequence, 148
 fluoro-2-deoxyglucose (FDG)-PET, 111
 focal renal masses, 46–53, 48–52
 characterization, 47–51
 DWI limitations, 51
 follicular lymphoma, 113
 fractional anisotropy (FA), 2, 3, 10, 200

- kidneys, 36
 prostate, 78, 189
 fractional irradiation, 178
 free-breathing imaging, 18, 20–19
 female pelvis, 120
 kidneys, 33, 34
 lymph nodes, 106
 pancreas, 56
 renal masses, 47
 functional magnetic resonance
 imaging (fMRI), 5
 fusion imaging, 56, 121, 122, 135
 gadolinium, 22, 29, 47, 82
 Gardner' syndrome, 59
 gastric cancer, 104
 gastrinoma, 61
 gemcitabine, 181
 generalized autocalibrated partially
 parallel acquisition (GRAPPA), 147
 geometric distortion, 199, 202
 gestational age, 38
 ghosting artifacts, 69
 Gleason score, 12
 gliomas, 172, 174
 glomerular filtration rate (GFR), 38
 glucagon, 74, 82
 glucagonoma, 63
 grade of tumors, 128
 gradient and spin echo (GRASE), 7
 gradient reversal schemes, 199
 gradient schemes, 120
 half-Fourier-acquisition single-shot
 turbo-spin-echo (HASTE), 147
 hemangioma, 24, 162
 hepatic metastases, 21, 22, 25
 hepatic tissue, 10
 hepatocellular carcinoma (HCC), 10,
 22, 23, 27, 181
 TACE, 28
 treatment monitoring, 187
 treatment response, 185
 water ADC measurements, 185–6
 hereditary pancreatitis, 59
 HIF- α , 178
 high intensity focused ultrasound,
 81, 189, 190
 high signal intensity, 123, 127
 higher magnetic field, 202
 histogram analysis, 53, 205
 hormone therapy, 80
 HT29, 191
 hyalinization, 130
 hydronephrosis, 38, 40, 42
 hyoscine butyl bromide, 74, 82
 hypercellularity, 110, 111
 hyperintensity, 150
 hypointensity, 150
 ice water phantom, 204, 205
 image acquisition, 198–204
 image co-registration, 8
 image distortion, 199
 image interpretation, 206–8
 image optimization, 198
 image processing, 57
 image subtraction, 47, 48, 49
 imaging standardization, 204
 infections, 46, 103, 153
 inflammation, 111, 153, 191
 infliximab, 191
 initial area under the gadolinium
 curve (IAUGC), 82
 in-phase acquisition, 151, 153, 157
 insulinoma, 61
 intermediate regime, 5
 inter-observer reproducibility, 111
 interstitial nephritis, 40
 interstitial spaces, 165
 intervertebral disks, 156, 157
 intracellular space (ICS), 185, 186
 intraductal papillary mucinous
 neoplasm (IPMN), 64
 intrahepatic (IH) HCC, 186
 intramuscular myxoma, 165
 intra-observer reproducibility, 111
 intratumoral hemorrhage, 91
 intravoxel incoherent motion (IVIM),
 4–5, 9, 205, 207, 208
 kidneys, 46, 53
 liver, 22, 24, 27
 lymph nodes, 106, 107
 perfusion fraction, 10
 inverted gray scale, 121
 iodized oil, 181
 iron overload, 10
 ischemia, 46, 81, 111, 185
 islet cell tumors.
neuroendocrine tumors *Sislets* of
 Langerhans, 61
 isotropic diffusion, 2, 3, 35
 keratin, 164
 kidney lesions, 47–8
 kidney transplants, 33, 39, 43
 DWI in, 41–4
 imaging adjustments, 35
 kidneys, 10–12, 32–44, 36–43, 47
 diffuse renal diseases, 37–41
 DWI acquisition and processing,
 32–6
 DWI limitations and future
 directions, 44
 focal renal masses, 46–53, 48–52
 k-space, 5, 6, 146
 Larmor frequencies, 147
 laryngeal tumor, 182
 least-squares curve-fitting, 77
 leiomyomas, 125, 129, 130, 132,
 133, 135
 leiomyosarcoma, 130, 187
 line scan diffusion imaging (LSDI),
 76, 146, 162
 lipoma, 162, 166, 169
 liposarcoma, 166
 liver, 10, 11, 18–29
 b-values and sequence optimization,
 19–20
 DWI acquisition techniques, 18–19
 DWI limitations, 27
 image display and processing, 20
 qualitative visual assessment, 20–1
 quantitative assessment, 21
 sequence parameters, 20
 water ADC measurements, 185–7
 liver biopsy, 23
 liver cancer
 treatment monitoring, 187
 treatment response, 181, 192
 liver fibrosis, 21, 23–5, 27
 liver lesions, 19, 21, 23, 29
 apparent diffusion coefficients, 26
 detection and characterization, 21–3
 liver metastases, 21, 25, 60, 187, 192
 liver transplantation, 24
 localized prostate cancer, 73
 locally advanced breast cancer
 (LABC), 93
 locally advanced prostate cancer, 73
 lung cancer, 104, 111
 lymph node biopsy, 104
 lymph node dissection, 104, 107
 lymph node metastases, 60, 104, 110,
 112, 138
 lymph nodes, 106–15
 ADC normalization, 112–14
 anatomical and functional imaging,
 104–5
 imaging role in, 104
 in oncology assessment, 103–4
 size, 104, 109
 staging, 109–12
 whole body DWI, 105–12
 lymphadenopathy, 103, 107–9, 138
 macromolecular proteins, 110, 111
 magnetic resonance (MR) BI-RADS
 lexicon, 87
 magnetic resonance (MR)
 image-guided focused
 ultrasound, 140
 magnetic resonance (MR)
 neurography, 200
 magnetic resonance imaging (MRI),
 104, 105, 112, 119, 129, 162, 166

Index

- endorectal MRI magnetic resonance spectroscopy (MRS), 73, 82, 87, 95, 189
- malignant lymphomas, 112
- malignant soft tissue tumors, 166
- malignant vertebral compression fractures, 144, 149, 150, 153, 157
- mammography, 86, 92, 94
- Mangafodipir trisodium (MnDPDP), 22
- mass-forming pancreatitis, 55, 59–60, 62
- maximum intensity projection (MIP), 56, 57
- maximum likelihood values, 77
- MCF-7, 178, 180, 181
- MDA-mb-231, 180, 181
- mean diffusivity (MD), 2, 3, 10
- mean kurtosis (MK), 2, 3, 10
- measurement reproducibility, 202–4
- medulla, 10, 12, 36, 37, 38, 43
- metastatic prostate cancer, 73
- microcapillary perfusion, 80
- microcystic cystadenomas, 68
- minimally invasive therapy, 81
- monoexponential diffusion fitting, 35, 44, 77–8
- mucinous cystic neoplasms, 66, 67–8
- multiparametric imaging, 29, 82, 99
- multi-planar reconstruction (MPR), 57
- multiple endocrine neoplasia type 59
- multi-shot echo-planar imaging (MS EPI), 147, 162
- musculoskeletal diseases, 191
- myometrial invasion, 119, 129, 136
- myometrial tumors, 130–3
- myometrium, 126, 127, 135
- myosarcomas, 174–8
- myxoid matrix, 164–5
- myxoid tissue tumors, 166
- myxoma, 167
- Na⁺ MRI signal intensity, 182–5
- N*-acetylcholinol (NAC), 182
- National Comprehensive Cancer Network criteria, 80
- navigator echoes, 6, 145, 147
- necrosis, 46
- negative prospective values (NPV), 87
- neoadjuvant chemotherapy (NACT), 93, 96, 97, 99, 187–9
- nephrogenic systemic fibrosis (NSF), 18, 46, 47
- neuroendocrine tumor metastases, 24
- neuroendocrine tumors, 61–3
- N*-methyl-*N*-nitrosourea, 181
- nodal assessment, 138–9
- noise, 9
- non-dilated collecting system, 40
- non-endorectal MRI, 74
- non-functioning tumors, 61
- non-papillary RCCs, 48
- non-small cell lung cancer, 111
- non-vertebral bone marrow, 153–6
- nuclear magnetic resonance (NMR), 1
- diffusion NMR, 1–5
- nuclei pulposi, 156
- nucleus-to-cytoplasm ratios, 110, 111, 164
- Nyquist ghosting, 81
- ocular melanoma, 187
- opposed-phase acquisition, 151, 153, 157
- optimal diffusion weighting, 148–9
- orthotopic tumors, 181
- osteoporotic fractures, 144, 149, 152, 153, 155, 157
- ovarian cancer, 119, 134, 136
- oxaliplatin, 178
- paclitaxel, 178
- pancreas, 55–69, 56–66, 58–69
- DWI acquisition and processing, 55–7
- DWI limitations, 69
- pancreatic adenocarcinoma, 59–61, 62
- pancreatic cancer, 55, 59–61
- treatment response, 181
- pancreatic exocrine function, 57
- pancreatitis, 55, 57–9, 59–61, 62
- papillary RCC, 48
- papillomas, 91, 95
- parallel imaging, 27, 34, 55, 56, 87, 105
- bone marrow/spine, 147
- prostate, 74
- tumor assessment, 173
- parallel imaging undersampling, 6
- partial Fourier, 6
- pelvic-array coils, 74
- perfluorocarbon, 74
- perfusion, 80, 88, 90, 174, 186, 193
- perfusion contribution, 33
- perfusion fraction, 10, 22, 41
- perfusion-weighted imaging (PWI), 6
- peripheral nerves, 115
- peripheral zone, 12, 72, 78, 79
- peristaltic bowel motion, 34, 82
- peritoneal metastases, 119
- peritoneal tumors, 136–8
- phantoms, 204, 205
- pharmorubicin, 181
- phased-array coils, 34, 74
- phase-evolution diagram, 148
- photodynamic therapy, 178
- picture archiving systems (PACS), 204
- polydimethylsiloxane (PDMS), 204
- positron emission tomography (PET), 87, 94, 104, 105, 107
- post-inflammatory pseudocysts, 64
- post-renal disease, 38
- preoperative local staging, 86
- pre-renal disease, 38
- prognostic biomarkers, 80
- PROPELLER, 7, 148
- prostate, 12, 13, 72–83, 77–8
- ADC map derivation, 77–8
- anatomy, 72
- artifacts and limitations, 81–2
- DWI in the clinic, 78–81
- DWI technical considerations, 75–7
- fractional anisotropy, 78, 189
- future directions, 82
- histology, 73
- signal-noise-ratio optimization, 74–5, 77
- prostate cancer, 12, 72, 73–81, 103, 104, 114, 151, 201
- ADC values, 78
- imaging need in, 73–4
- prognostic biomarkers, 80
- response assessment, 80–1
- treatment response, 182, 189
- tumor detection, 79
- pseudo-anisotropy artifact, 19
- pseudocysts, 58, 64, 66
- pseudo-diffusion, 4, 5, 10
- pseudo-diffusion coefficient, 4, 90
- pseudopapillary tumor, 65
- PSIF sequence, 148
- pulsation effects
- kidneys, 33–4
- pulse sequence optimization
- liver, 19–20
- pulse sequence parameters
- liver, 20
- pancreas, 56
- prostate, 75–6
- pulse sequences, 5–8, 145
- pulsed electric field (PEF), 182
- PX-478, 178
- pyelonephritis, 38, 40, 41, 42, 51, 52
- pyonephrosis, 38, 40, 42
- qualitative assessment, 204, 205
- liver, 20–1
- quality assurance, 204–8
- quantitative assessment, 204, 205
- kidneys, 35–6
- liver, 21
- tumor treatment response, 206–7
- radial diffusivity, 2
- radial *k*-space sampling, 146
- radiation induced fibrosarcoma-1 (RIF-1), 176, 177, 182–3

- radical prostatectomy, 73
radiotherapy, 81
 breast cancer, 180
 colon cancer, 178
random errors, 109
rapid acquisition with relaxation enhancement (RARE),
- turbo-spin echo (TSE)**rectal
 cancer, 190–1, 192
refocusing pulse, 7, 75
regions of interest (ROIs), 47, 57, 88, 121, 162
relative ADC, 112
relative extracellular space (rECS), 173, 177, 186
relaxation times, 149
renal abscesses, 51, 52
renal artery stenosis (RAS), 38–9, 42
renal cell carcinoma (RCC), 11, 47, 48, 50, 51
renal cyst, 48
renal disease, 38
renal hydration state, 34
renal ischemia, 40
renal lesions, 49
renal mass vascularity, 11
renal oncocytoma, 51
repetition time (TR), 105
resectability, 60
respiration, kidneys, 33–4
respiratory cycle, 106
respiratory gating, 185
respiratory motion, 105, 106, 185
respiratory motion artifact, 69, 82
respiratory triggering, 18, 19, 20, 21
 kidneys, 33, 34, 43
 lymph nodes, 105
 pancreas, 56
 renal masses, 47
response criteria in solid tumors (RECIST), 26, 187
rhabdomyosarcoma, 166, 174, 177
rheumatic diseases, 191
rigid coils, 74, 75
risk stratification, 80
- scanner selection, 34–5
scanning times, 162
schwannoma, 164
scintimammography, 87
screening, 86
sebaceous cysts, 164, 165
secretin injection, 57
self-navigation, 146, 148
seminal vesicle invasion, 82
sensitivity encoding (SENSE), 87, 147
serosal disease, 119
serous cystadenoma, 69
serous cystadenomas, 66, 68–9
serum creatinine, 40
sextant biopsy, 82
short inversion time inversion recovery (STIR), 56, 88, 112, 114–15, 200, 202
signal intensity, 3, 122
signal-to-noise ratio (SNR), 1, 6, 69
 bone marrow/spine, 146
 breast, 88
 female pelvis, 119, 120
 prostate, 74–5, 77
single-axis DWI, 114–15
single-quantum SQ ²³Na MRI, 184
single-shot echo-planar imaging (SS EPI), 18, 27, 32, 46, 56, 146
 breast, 87
 female pelvis, 120
 prostate, 75
 renal masses, 47
single-shot fast spin echo (FSE), 75, 147, 149
size criteria, 104, 109, 140
slice selective gradient reversal technique (SSGR), 202
slice thickness, 106
slow diffusion component, 80
soft tissue tumors, 162–70
 benign/malignant differentiation, 166
 characterization, 163–5
 diffusion acquisition and processing, 162–3
 treatment response, 166–7
soft tissues, 163–70
soft-tissue sarcoma, 191
solid and papillary epithelial neoplasm, 63
spatial resolution, 147
spectral selected attenuation with inversion recovery SPAIR, 56
spin magnetization, 5
spine, 144–58, 145–55, 150–7
 DWI studies, 149–57
spin-echo EPI technique (SE-EPI), 32, 145–6
spondylitis, 153, 191
squamous cell carcinoma, 134, 170
squamous adenocarcinomas, 91, 94
staging
 lymph nodes, 109–12
 lymphomas, 112
 tumors, 103
standard diffusion vs. diffusion tensor imaging, 35–6
standardized uptake value (SUV), 111
steady-state free-precession (SSFP), 8, 148, 152, 200
Stejskal–Tanner pulse sequence, 1, 3, 148
stimulated echo acquisition mode (STEAM), 7
stimulated echoes (STE), 7, 145–6
stretched exponentials, 205, 208
stroma, 72, 73
stromal fibrosis, 81
subcutaneous-(sc-) implanted tumors, 174
super paramagnetic iron oxide (SPIO), 22
susceptibility artifacts, 69, 74, 75, 87, 144, 146
systematic errors, 109
- T1-weighted imaging (T1-WI), 91
T2 shine-through effect, 8, 21, 25, 57, 75, 123, 124
T2-relaxation time, 19, 20, 105, 106, 114
T2-weighted imaging (T2-WI), 21, 72, 73, 79, 91, 129
testosterone, 72
thermal necrosis, 190
three-dimensional (3D) imaging, 207
threshold values, 82
thymidilate synthetase, 176
time–intensity curve shapes, 86
time-resolved information (4D), 207
tissue diffusivity, 10
topoisomerase II, 178, 181
TRA-8, 181
trace ADC maps, 162
trace diffusion images, 20, 115
transarterial chemoembolization (TACE), 28, 181, 187
transition zone:, 72
traumatic fractures, 144
triple quantum-filtered (TQF) ²³Na MRI, 184
tuberculosis, 153
tumor necrosis factor-related apoptosis-inducing ligand (TRAIL), 179, 180
tumor treatment response, 25–7, 172–90, 173–90, 175–88
 ADC in animal models, 174–82
 human patients, 187–91
 liver, ADC measurements in, 185–7
 predicting, 191
 quantitative assessment, 206–7
 structural post-treatment changes, 182–5
tumors, 10, 46, 55
 cellularity and grade, 128
 depth of invasion, 135–6
 detection and characterization, 129–35
 female pelvic, 119–40
 neuroendocrine, 61–3
 pancreas, 64

Index

- tumors, (cont.)
 recurrence, 140
 staging, 103
turbo-spin echo (TSE), 7, 32, 147–8
ultrasmall superparamagnetic
 iron oxide (USPIO), 107,
 139, 114
ultrasound, 55, 57, 81, 86, 94, 140,
 189, 190
unequal directional diffusion, 200
ureteral obstruction, 38, 40–1, 42
ureteral stone, 42
- urinary bladder cancer, 114
urinary tract obstruction, 38
uterine artery embolization (UAE), 119
uterine cancer, 107, 112
uterine fibroid embolization (UFE),
 140, 189
uterine fibroids, 140, 189
uterine myometrium, 126
uterine sarcoma, 132
- vascular targeting agents, 166
- vertebral compression fractures, 144,
 149, 151, 152, 153, 157
vertical motion, 33
voxelwise analysis, 205, 206
VX2 tumors, 181, 186
- water diffusion, 4, 55, 87, 88, 90, 91,
 129, 140, 173, 200
water proton mobility, 32
whole body imaging,