

Optimize Your Musculoskeletal Tumor Registry Data Capture with Epic SmartForms

October 25th 2023

Agenda

- Background: Musculoskeletal Tumor Registry
- MsTR Differentiators and Data Elements
- Background: SmartForms
- SmartForm Updates and Access
- Q&A

MsTR | Background



Through collaboration with the Musculoskeletal Tumor Society (MSTS), MsTR is the third subspecialty registry to be incorporated into the AAOS family of registries.

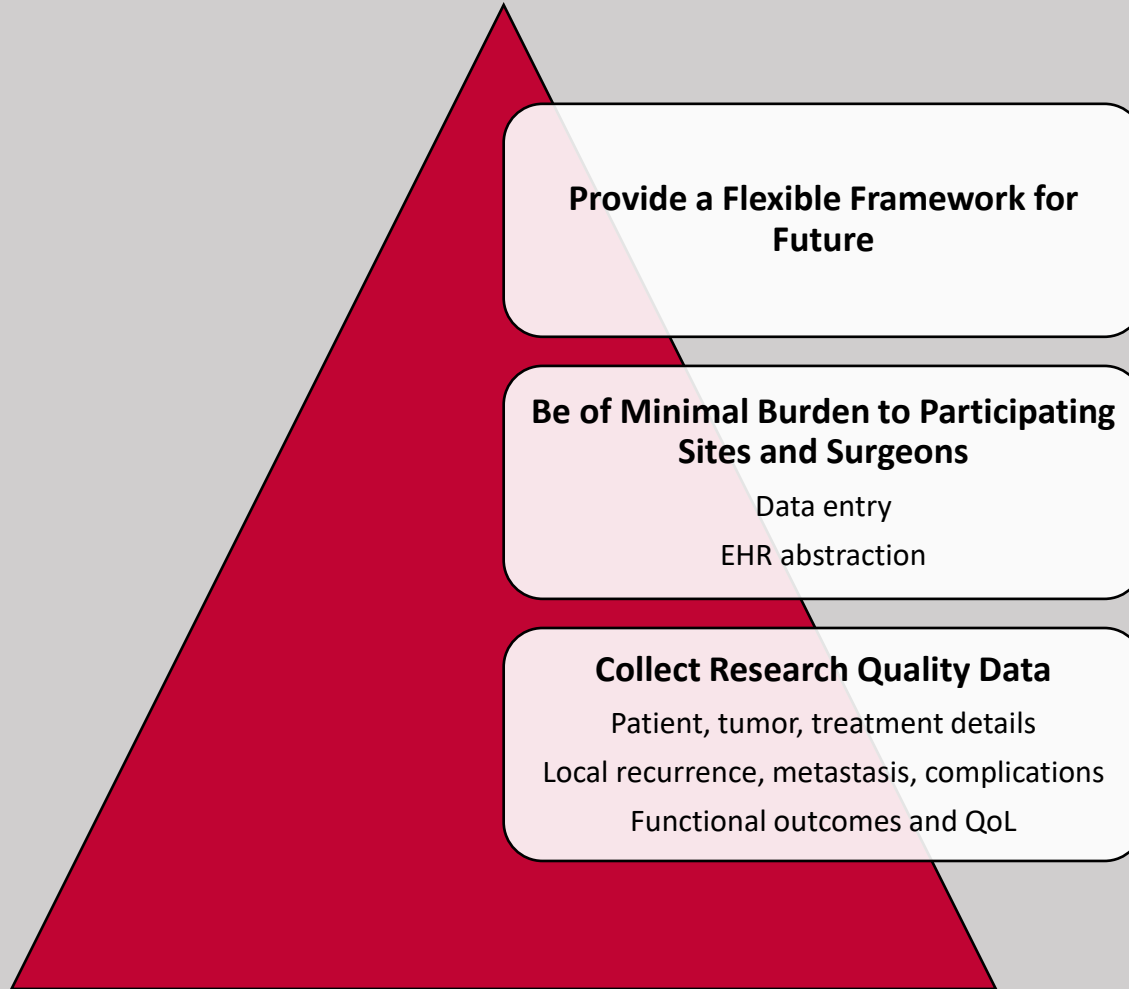


The wide-spread rollout of the MsT Registry allows surgeons to combine data about rare bone and soft tissue tumors from sites around the country, thereby potentially answering treatment and outcome questions that are otherwise unable to be answered due to the rarity of the disease.



The MsTR feedback and dashboards will help clinicians and health systems track function, complications, and outcomes in patients treated for these sarcomas with the potential to expand to metastatic bone disease and other musculoskeletal tumors in the future.

MsTR | Guiding Pillars



MsTR Steering Committee

- **Benjamin James Miller, MD, MS, FAAOS – Chair**
University of Iowa
- **Megan E. Anderson, MD, FAAOS**
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Boston Children's Hospital
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- **Joseph Schwab, MD, MS, FAAOS**
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MsTR | Differentiators

Diagnosis Based Registry

- Patients appropriate for inclusion are identified by their underlying ICD-10 DX code
- More than 60 unique ICD-10 codes are utilized to trigger registry inclusion

Provider Entered Elements

- Not easily extracted from EHR
- Value add for research quality data

Registry Participation Requirements

- SmartForm Utilization
- Exploring additional standardized data collection methods

MsTR | Data Element Overview

i **PATIENT**

- Name (Last, First)
- Date of Birth
- Social Security Number
- Diagnosis (ICD-10, CPT)
- Gender
- Race/Ethnicity
- Height + Weight/Body Mass Index
- Payer Status

SURGICAL INTERVENTION

- Procedure Type (ICD-10, CPT)
- Date of Surgery
- Implants
- Details Surrounding Surgery Type
- Comorbidities (ICD-10)

NON-SURGICAL INTERVENTION

- Chemotherapy
- Radiation
- Clinical Trial

1 **TUMOR BASELINE**

- Size
- Metastasis at Diagnosis
- Margins
- Tissue Type
- Biopsy Type

2 **ENCOUNTERS**

- Hospital Admission
- Procedure (ICD-10, CPT)
- Diagnosis (ICD-10)
- Recurrence

3 **PROs**

- PROMIS-10 Global or VR-12
- MSTS
- TESS

MsTR | Data Element Sources

Abstracted from EHR

- Patient demographics
- Treatment dates, procedures
- Diagnosis codes
- Manufacturers and implants

Entered by practitioner

- Tumor details
Location, size, histology, stage
- Treatment details
Systemic therapy, radiation, reconstruction
- Complications

What is a SmartForm?

- SmartForms capture detailed procedure-specific information.
- Go beyond traditional ICD-10 and CPT coding.
- Include tailored data elements for patient presentation, procedure, approach, tissue observations, and complications.
- SmartForms use branching logic to gather additional clinically relevant details as data points are provided.

Value of Smartforms for Data Capture

Streamlined and Standardized Data Entry

- Standard EPIC released elements
- SmartForms allow for conditional branching logic format to better facilitate ease of data entry while minimizing clinician burden.
- Ulowa pre-built conditional forms to allow for instant implementation within user environments.
- Provides institutions with a means to centralize data collection within the registry framework of AAOS

SmartForm | Development

- Allows provider to collect historical information
- Patient level Smart Data Elements (SDE)
- Includes question “Should this patient be included in the MsT Registry?”
 - Goal for this questions was to allow for troubleshooting and validation
- Record Complete selection
 - Causes larger font “Record Complete” to display at top of form
- Note can be generated from form completion

The screenshot displays a web-based medical form titled "MsT Disease and Treatment Summary". At the top, there is a navigation bar with icons for Snapshot, Chart Review, Screenings, Notes, Results Review, Rooming, Plan, and Wrap-Up. Below the navigation bar, the form content includes a question: "Should this patient be included in the MsT registry?" with "Yes" and "No" radio buttons. A large orange "Record Complete" notification is prominently displayed. The form is organized into several sections with expandable headers:

- Biopsy:** Includes fields for "Date of diagnostic biopsy", "Institution where biopsy performed" (with "treating institution" and "referring institution" buttons), and "Method of Biopsy" (with buttons for "fine needle aspiration (FNA)", "core needle biopsy", "incisional biopsy", and "excisional biopsy").
- Primary Tumor Location:** Includes "Side" (left, right, midline), "Bone/Soft Tissue" (bone, soft tissue), "Location" (upper extremity, lower extremity, axial), "Location for lower extremity bone" (pelvis, femur, patella, tibia, fibula, hindfoot, midfoot, forefoot), "Longitudinal location within compartment" (Proximal, Midshaft, Distal, Not applicable), and "Radial location in extremity" (Anterior, Posterior, Medial, Lateral, Not applicable).
- Additional Tumor Details:** Includes "Final Diagnosis - Bone" (giant cell tumor, Ewing's sarcoma, chondrosarcoma, osteosarcoma, chordoma, Other), "Subtype" (Conventional, Surface, Telangiectatic, Small cell, Low-grade central), and "Grade (FNCLCC)" (G1, G2, G3, GX, Benign).
- Pretreatment tumor size:** Includes "Preoperative cross-sectional imaging not available" (checkbox) and "Length (cm)", "Depth (cm)", and "Width (cm)" input fields.
- Additional Staging Information:** Includes "Tumor size greatest dimension" (less than 5 cm, 5-10 cm, 10-15 cm, greater than 15 cm, not applicable), "Tumor Depth" (superficial, deep), "Compartment Status" (intra-compartmental, extra-compartmental), "Pathologic Fracture" (Yes, No), and "Metastasis" (Yes, No).
- Margins:** Includes "Final Clinical" (wide (R0) > 1mm, no residual tumor, marginal (R0) < 1mm).

At the bottom of the form, there are buttons for "ADD ORDER" and "ADD DX (4)".

SmartForm | Development

- Details appear in Clinic note through text generation
- Captures discrete data through documentation that follows a surgeon's existing workflow and thought process

Follow-up Encounters:

- Custom Multi-Tab exam SmartForm
- Includes tab for Musculoskeletal Tumor Score

SmartForm Designer - AAOS AMB SF ORT MST FU [1600] - Exam SF

MsT Follow Up
Did this patient have an adverse event since their last encounter? Yes No

▼ **Complication details**

Form Settings

- MsT Follow Up X
- Did this patient have an adverse even... X
- Did the adverse event occur within 1 ... X
- Approximate date of recognition of ad... X
- Type of Complication X
- Type of oncologic event X
- Site of distant recurrence X
- Return to OR completed? X
- Return to OR planned? X
- Complication details X
- Method of initial recognition of meta... X
- Histologic confirmation X
- Initial method to determine local pro... X
- Type of Surgical Complication X
- Type of Infection X
- Detail of structural failure X
- Detail of soft tissue failure X
- End of group

Physical Exam

Complications Exam Tumor MsT Follow Up

MsT Follow Up

Did this patient have an adverse event since their last encounter? Yes No

Did the adverse event occur within 1 month of this clinical encounter? Yes No

Approximate date of recognition of adverse event

Type of Complication surgical complications oncologic complication

Return to OR completed? Yes No

▼ **Complication details**

Type of Surgical Complication structural failure soft tissue failure infection aseptic loosening

Detail of structural failure bone fracture implant fracture nonunion

My Note

Service: Orthopedics

Date of Service:

{Ros - complete:30496}

Objective:
There were no vitals taken for this visit.
PHYSICAL EXAM
Musculoskeletal Tumor Follow Up
new adverse event since last encounter.
no adverse event in prior month
Approximate date of recognition of adverse event:
12/16/2021
surgical complications
structural failure

Detail of structural failure:
Fracture

Patient had a return to OR completed.

SmartForm | Alleviating Initial Barriers to Participation

No staff requirement

Conditional Branching Logic: minimize data entry time by only answering relevant questions

Time per case: 1.5 minutes

Entry -> 1 minute

Operative Notes -> 30 seconds

Can be done when dictating notes

Asynchronous process: data input does not need to happen all at once

Abstraction of clinical info can happen electronically

SmartForms have been created specifically to work into the clinical flow and align with AAOS MsTR data specs

SmartForm | Limitations with Implementation, Utilization, & Data Extraction



Complex Retrieval and Install



Non-Standardized Data Elements



Customization Overhead



Lack of Standardized Reporting



Data Consistency

SmartForm | How New Adaptation Addresses and Solves for Limitations



**Simplified
SmartForm
Retrieval and Install**



**Standardized Epic
Data Elements**



**Customization
Overhead Reduced**



**Standardized
Reporting**



Data Consistency

Smart Data Element Submission

	A	B	C	E	G	K	N	O	P	Q	R	W	X	Z	AA	AB	AC	AD	AE	AF	AG	AH
		SmartData Identifier	Clear Submission	Import	Generate Mapping File																	
	Element State	Element Abbreviation	SmartData Type	Categories	Element Description	INI	Item	Submitter Comments	SME Comments	SME Decision	Parent Element Identifier	Parent Element Name										
1		I HLX 40	I HLX 50	I HLX 60	I HLX 180	I HLX 45																
2	New	Bone/Soft Tissue	Category	Bone, Soft Tissue				UIHC#ORTTUMOR#MSTS#046														
3	New	Date of Diagnostic Biopsy	Date					UIHC#ORTTUMOR#MSTS#001														
4	New	Institution Where Biopsy Performed	Category	Treating institution, Referring institution				UIHC#ORTTUMOR#MSTS#002														
5	New	Method of Biopsy	Category	Fine needle aspiration, Core needle biopsy, Incisional biopsy, Excisional biopsy				UIHC#ORTTUMOR#MSTS#004														
6	New	Margins	Category	R0 - negative margins, R1 - microscopic positive margins, R2 - macroscopic positive margins				UIHC#ORTTUMOR#MSTS#005	We have EPIC#42394 but those categories don't include the details after R0/1/2. But that's our standard one we use for staging													
7	New	Primary Tumor Location	Element ID					UIHC#ORTTUMOR#MSTS#007														
8	New	Axial Location Bone	Category	C-spine, T-spine, L-spine, Sacrum, Sternum/ribs				UIHC#ORTTUMOR#MSTS#013														
9	New	Axial Soft Tissue	Category	Chest/trunk, Flank, Paraspinal				UIHC#ORTTUMOR#MSTS#016														
10	New	Longitudinal Location Within Compartment	Category	Proximal, Midshaft, Distal, Not applicable				UIHC#ORTTUMOR#MSTS#017														
11	New	Lower Extremity Location Bone	Category	Pelvis, Femur, Patella, Tibia, Fibula, Hindfoot, Midfoot, Forefoot				UIHC#ORTTUMOR#MSTS#011														
12	New	Additional info for pelvis	Category	Zone 1, Zone 2, Zone3, sacrum				UIHC#ORTTUMOR#MSTS#012														
13	New	Lower Extremity Soft Tissue	Category	Gluteal, Pelvis, Thigh, Knee, Popliteal fossa, Leg, Ankle, Foot				UIHC#ORTTUMOR#MSTS#015														
14	New	Muscle Compartments Involved With Extremity	Category	Anterior, Posterior, Medial, Lateral, Not applicable				UIHC#ORTTUMOR#MSTS#018														
15	New	Side	Category	Right, Left, Midline				UIHC#ORTTUMOR#MSTS#008	We have STG 500 this could point to if you wanted													
16	New	Location	Category	Upper extremity, Lower extremity, Axial				UIHC#ORTTUMOR#MSTS#009														
17	New	Upper Extremity Location Bone	Category	Scapula, Clavicle, Humerus, Radius, Ulna, Carpus, Metacarpals, Phalanges				UIHC#ORTTUMOR#MSTS#010														
18	New	Upper Extremity Soft Tissue	Category	Axilla, Shoulder, Arm, Elbow, Forearm, Wrist, Hand				UIHC#ORTTUMOR#MSTS#014														
19	New	Radiation	Element ID					UIHC#ORTTUMOR#MSTS#036														
20	New	Modality of Radiation Delivery	Category	Conventional external beam, Intensity Modulated (IMRT), Stereotactic, Brachytherapy, Proton beam				UIHC#ORTTUMOR#MSTS#043														
21	New	Timing of Radiation	Category	Preoperative, Postoperative, Intraoperative				UIHC#ORTTUMOR#MSTS#038	We have ECT 55601 that we could point to here													
22	New	Postoperative End Date	Date					UIHC#ORTTUMOR#MSTS#042														
23	New	Postoperative Start Date	Date					UIHC#ORTTUMOR#MSTS#041														
24	New	Preoperative End Date	Date					UIHC#ORTTUMOR#MSTS#040														
25	New	Preoperative Start Date	Date					UIHC#ORTTUMOR#MSTS#039														
26	New	Total Radiation Dose	Number					UIHC#ORTTUMOR#MSTS#044														
27	New	Use of Radiation	Boolean					UIHC#ORTTUMOR#MSTS#037														
28	New	Where was radiation delivered?	Category	Treating institution, Other institution				UIHC#ORTTUMOR#MSTS#045														
29	New	Should patient be included in registry?	Boolean					UIHC#ORTTUMOR#MSTS#047														
30	New	Stage At Initial Diagnosis	Element ID					UIHC#ORTTUMOR#MSTS#019														
31	New	Compartment Status	Category	Intracompartmental, Extracompartmental				UIHC#ORTTUMOR#MSTS#024														
32	New	Depth	Number					UIHC#ORTTUMOR#MSTS#021														
33	New	Length	Number					UIHC#ORTTUMOR#MSTS#020														
34	New	Metastasis	Category	None, Lung, Lymph nodes, Bone - other sites, Bone - skip metastasis, other				UIHC#ORTTUMOR#MSTS#027	We have EPIC#3100073819 / ECT 550423, but not sure what "Bone - skip metastasis" means													

Alignment of Smart Data Elements to the Spec Manual and submission to Epic to create foundation elements

We have EPIC#42394 but those categories don't include the details after R0/1/2. But that's our standard one we use for staging

We have STG 500 this could point to if you wanted

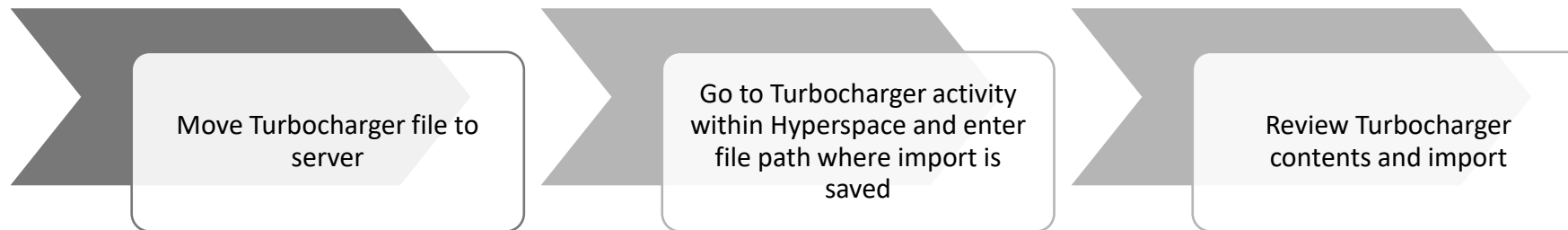
We have ECT 55601 that we could point to here

We have EPIC#3100073819 / ECT 550423, but not sure what "Bone - skip metastasis" means

SmartForm | Access

- SmartForms can be accessed through Turbocharger package in the Epic Community Library
 - Turbochargers are tools to share content created with Epic
- No specific Epic modules that are needed (i.e. bones module)
- Turbocharger package will work in Epic versions May 23 and lower
 - If on May 22 then special update *E10222175* is needed
 - If on Nov 22 then special update *E10304083* is needed

****Special updates are for the final Epic-released SDEs so that all SDEs in the SmartForms are Epic-released*



QUESTIONS?