

MSTR LUNCH & LEARN

October 9th, 2024

AAOS
AMERICAN ACADEMY OF
ORTHOPAEDIC SURGEONS

MSTR MUSCULOSKELETAL
TUMOR
REGISTRY

MUSCULOSKELETAL TUMOR REGISTRY



MSTR BACKGROUND

MSTR – MISSION, VISION AND STRATEGY

- We will improve care, outcomes, and quality of life for patients with musculoskeletal tumors by developing a first-of-its-kind centralized record of patient, tumor, treatment, and outcomes data on musculoskeletal neoplasia in the pelvis, spine, and extremities.
- The database will be of research quality and will enable investigation into:
 - Natural history of the disease
 - Risk factors
 - Quality and delivery of care
 - Oncologic and reconstructive outcomes
 - Prognosis
 - Function
 - Patient quality of life
- The database will be designed to:
 - Facilitate maximum participation by AAOS and MSTTS members
 - Minimize the burden of data entry
 - Capture a comprehensive set of relevant information
 - Maintain flexibility for future modifications as needed



MSTR STEERING COMMITTEE

Benjamin J. Miller, MD, MS, FAAOS – Chair

- **University of Iowa Hospital and Clinics**

Megan E. Anderson, MD, FAAOS

- **Beth Israel Deaconess Medical Center**
- **Boston Children's Hospital**

Meredith Bartelstein, MD, FAAOS

- **Memorial Sloane Kettering Cancer**

Eric Henderson, MD, FAAOS

- **Dartmouth-Hitchcock Medical Center**

Adam S. Levin, MD, FAAOS

- **Johns Hopkins University**

Nathan Wesley Mesko, MD, FAAOS

- **Cleveland Clinic**

Shalin Patel, MD

- **The University of Texas MD Anderson Cancer Center**

Joseph Schwab, MD, MS, FAAOS

- **Cedars-Sinai Medical Center**

Kristy L. Weber, MD, FAAOS

- **University of Pennsylvania**

Rosanna Wustrack

- **UCSF Health**

MUSCULOSKELETAL TUMOR REGISTRY



ESTABLISHED IN 2019, PUBLIC LAUNCH IN 2021

- **25** sites actively contracted
- **8** sites submitting
- **1,900+** baseline records
- **709** cases enriched with provider-entered details
- **200+** encounter records
- **17** surgeons

MODULES

- Sarcoma
- Metastatic Bone Disease (Release by end of Q1 2025)

MSTR VALUE PROPOSITION



Enhanced Patient Care & Safety

Support Clinical Decision-Making

Address Gaps in Patient Care

Identify Best Practices



Quality & Outcomes Insights

Patient Safety Protocols & Risk Management

Outcomes Monitoring

Continuing Education & Patient Education



Contributing to Orthopaedic Community

Inform Future Measures

Maintain Standards of Care

Research Opportunities



Demonstrating Excellence & Quality

Patient Steerage—Increasing Volume

Enhanced Reputation

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MUSCULOSKELETAL
TUMOR
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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

- Epic SmartForm Utilization
- Alternative Entry Participation Pathway (COMING SOON!)

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.

MUSCULOSKELETAL TUMOR REGISTRY




MSTR DATA

DATA ELEMENT OVERVIEW




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




TUMOR BASELINE

Size
Metastasis at Diagnosis
Margins
Tissue Type
Biopsy Type



ENCOUNTERS

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



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

DATA LEVELS

Data Levels organize different kinds of patient information based on when and how they are collected during the patient's episode of care timeline.

Level 1 Data

Baseline/Index Encounter

Details about the initial procedure, diagnosis codes, baseline patient demographics, and tumor details.

Level 2 Data

Follow-Up Encounters

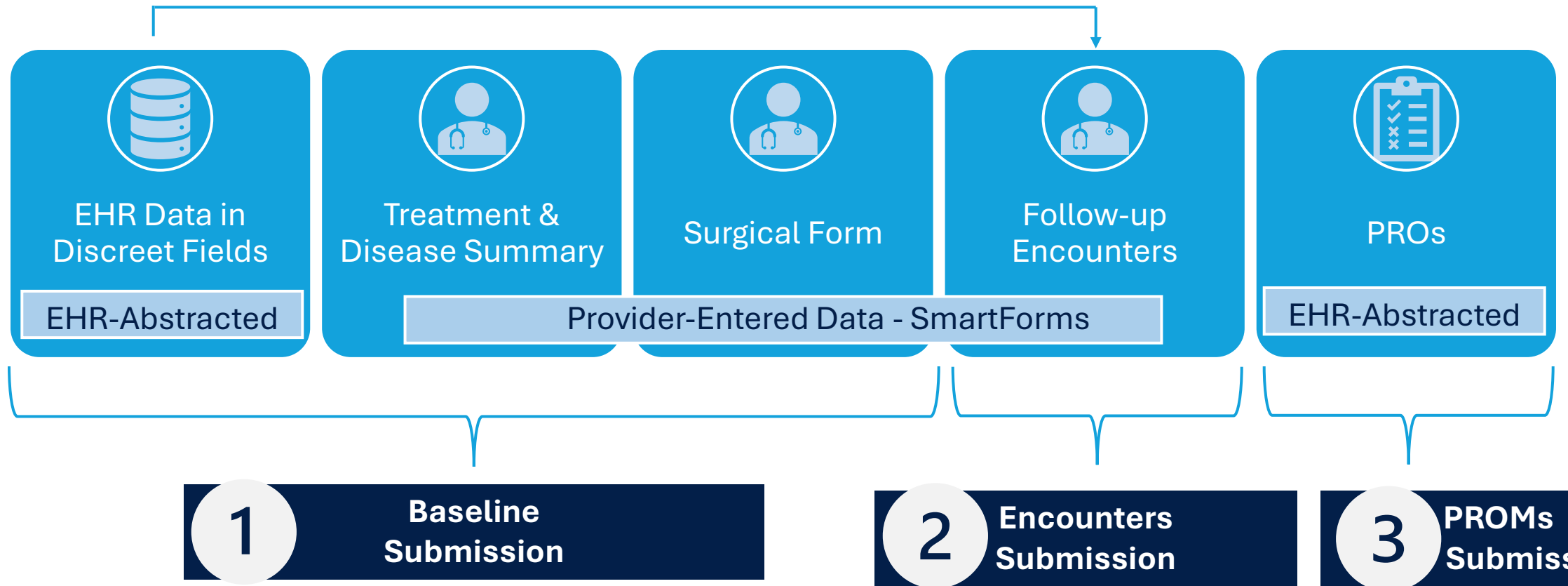
Data collected during subsequent follow-up visits, such as complications and return to OR.

Level 3 Data

Patient-Reported Outcome Measures (PROMs)

Patient-reported data, including quality of life assessments, functional outcome scores, and patient satisfaction surveys.

HOW TO SUBMIT YOUR DATA TO THE MSTR

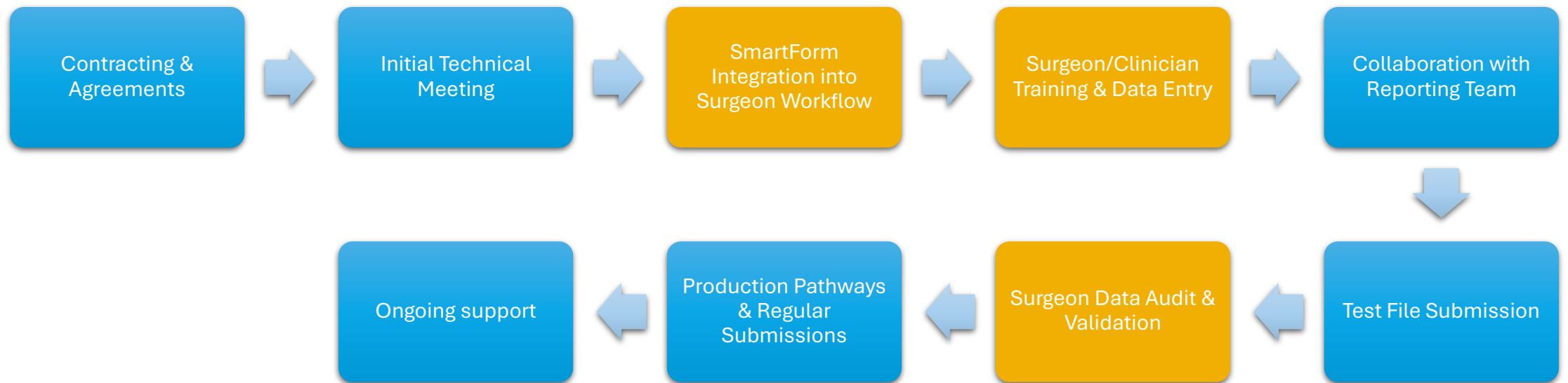


MUSCULOSKELETAL TUMOR REGISTRY



MSTR ONBOARDING

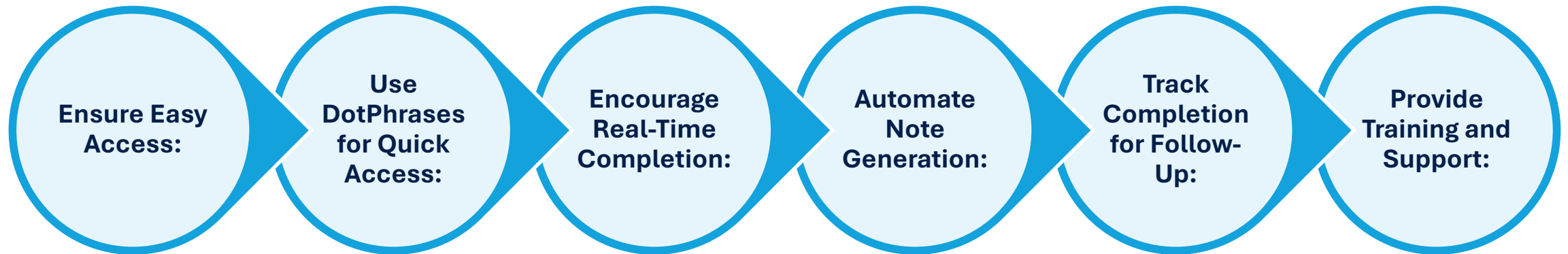
CURRENT MSTR ONBOARDING PROCESS



MUSCULOSKELETAL TUMOR REGISTRY

MSTR SMARTFORM WORKFLOW

OPTIMIZING SMARTFORM WORKFLOW FOR SURGEONS



- **Embed the SmartForm in the Navigator:** Position the SmartForm in the Navigator tab where surgeons frequently access patient data, so it becomes a natural part of their routine.
- **Create Shortcut Buttons:** Add clear buttons for SmartForms in NoteWriter or other relevant sections, reducing clicks and making the forms easily accessible during documentation.

- **Leverage DotPhrases:** Encourage surgeons to use predefined dot phrases (ex., .MSTRSARCOMASURGFORM) to quickly pull up SmartForms while writing notes. This minimizes disruption in their workflow and allows for real-time data entry.

- **Fill Out SmartForms During Procedures:** Suggest that surgeons complete SmartForms during or immediately after surgeries or patient interactions. This helps ensure accurate and timely documentation without the need for follow-up corrections.

- **Enable SmartForms to Generate Notes:** Configure the SmartForms to auto-generate notes once completed. This reduces the need for surgeons to manually document information and speeds up the overall workflow.

- **Monitor Form Completion:** Set up tracking mechanisms to ensure forms are started and completed. This can include pulling reports that show if a form has been initiated but not marked as "Record Complete," allowing coordinators to follow up with surgeons on incomplete documentation.

- **Offer Training on SmartForm Use:** Make sure surgeons are trained on how to access and complete SmartForms efficiently. Provide step-by-step guides, training sessions, or even quick reference cards with common dot phrases and workflows.
- **Support Ongoing Adjustments:** Be open to modifying the SmartForm or workflow based on surgeon feedback to ensure it remains user-friendly and effective in daily practice.

SMARTFORM – DISEASE AND TREATMENT SUMMARY

Can be accessible from Navigator Tab

Patient level Smart Data Elements (SDE)

Collection not specific to surgery and data points carry across settings

The screenshot displays the 'MsT Registry Modules' interface. The top navigation bar includes tabs for Snapshot, Chart Re..., Results, MsT Regist..., Plan, Charges, NoteWriter, and others. A red box highlights the 'Results' tab, with a red arrow pointing from the text 'Can be accessible from Navigator Tab' to it. The main content area is titled 'MsT Disease Presentation and First-line Treatment Summary' and includes sections for Biopsy, Primary Tumor Location, Additional Tumor Details, and Pretreatment tumor size. The right-hand panel shows 'My Note' with sections for Physical Exam, Review of Systems, Assessment & Plan, and Staff Involved.

SMARTFORM – DISEASE AND TREATMENT SUMMARY

- Allows provider to collect retrospective and prospective data.

Allows sites to check if a form was started but not fully completed, so they can alert surgeons to finish the form if needed.

Includes question “Should this patient be included in the MsT Registry?”

- Primary function of this question is to allow for troubleshooting and validation by indicating a form has been started.

The "Record Complete" button marks the form as fully finished, showing a bold "Record Complete" message.

MsT Disease and Treatment Summary

Should this patient be included in the MsT Registry? Yes No

Record Complete

Biopsy

Date of diagnostic biopsy

Institution where biopsy performed

Method of Biopsy

Primary Tumor Location

Side

Bone/Soft Tissue

Location

Location for lower extremity bone

Longitudinal location within compartment

Radial location in extremity

Additional Tumor Details

Final Diagnosis - Bone

Subtype

Grade (FNCLCC)

Pretreatment tumor size

Preoperative cross-sectional imaging not available

Length (cm)

Depth (cm)

Width (cm)

Additional Staging Information

Tumor size greatest dimension

Tumor Depth

Compartment Status

Pathologic Fracture

Metastasis

Margins

Final Clinical

Total Radiation Dose (Gray)

Number of fractions

Was radiation delivered at treating institution?

Record Complete

Complete

SMARTFORM – SURGICAL FORM

Can be accessible by typing a DotPhrase in the Surgical Note to quickly pull up and complete the relevant SmartForm

The screenshot displays the Epic EMR interface for a patient named Watson, Test "Bob". The main window is titled "NoteWriter" and shows a surgical note for "OR CASE: EXCISION OF OSTEOCHONDROMA". The note is performed by Benjamin J. Miller, MD, and authorized by Prickett, Jamison, ARNP. The note includes pre-procedure details such as verbal consent and time out. A dropdown menu is open, showing a list of SmartForms that can be accessed by typing a DotPhrase. The dropdown menu is titled "mst" and contains the following items:

Name	Description
☆ MST	Bilateral mild maxillary sinus tenderness is present.
☆ MSTEN	mitral stenosis
☆ MSTRMBDFU	Smartblock smart form for AAOS MSTR Musculoskeletal Bone Disease Follow Up Form
☆ MSTRMBSURG	Smart block smartform link for AAOS Musculoskeletal Tumor Registry Musculoskeletal Bone Dise...
☆ MSTRSARCOMAFU	Smartblock smart form for AAOS MsTR Sarcoma Follow Up Form
☆ MSTRSARCOMASURG	Smart block smartform link for AAOS Musculoskeletal Tumor Registry surgical procedure docume...

The dropdown menu also includes a note: "any pertinent indications, complications/plan. This SmartList is reference only. It will not be filed in the note. (39753) [***]". Below the dropdown menu, the "Staff Procedure Presence" section is visible, showing "PA/ARNP/Resident/Fellow Procedure Presence Statement (required)" and the name "Benjamin J Miller, MD".

SMARTFORM – FOLLOW UP FORM

- Details from SmartForm can populate in a Clinic note through text generation

The screenshot displays the Epic NoteWriter interface. On the left, the 'MST Follow Up' SmartForm is shown with the following fields and values:

- 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: 12/16/2021
- 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

On the right, the 'My Note' window shows the generated text for the 'Physical Exam' section. A red box highlights the following text:

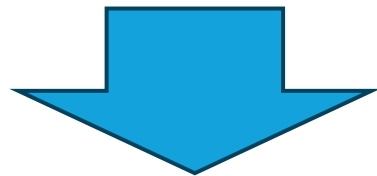
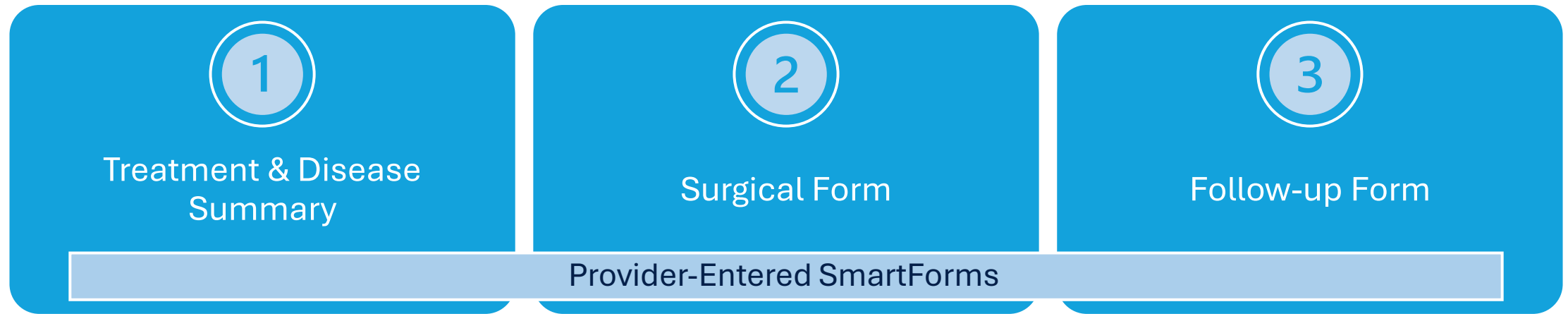
{Ros - complete:30496}

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

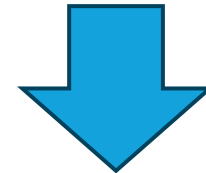
Detail of structural failure:
Fracture

Patient had a return to OR completed.

SMARTFORM DATA GROUPINGS FOR MSTR SUBMISSION



Baseline Submission



Follow up Encounters Submission

MUSCULOSKELETAL TUMOR REGISTRY

MSTR DASHBOARDS

9/27/24 The Sept. 2024 Release Notes have been added to Tools and Resources. The Sept. releases impact AJRR, FTR, SER, and ASR.

Stats

Latest File Upload

Success All records in the file were processed without any warnings or rejections.

Partial Case Rejection Some records in the file were rejected due to submitted element values or file format not aligning with the AAOS data specifications. These rejections must be corrected and the file resubmitted. The user should select the View link for detailed information.

All Cases Rejected All records were not successfully processed due to submitted element values or file format not aligning with the AAOS data specifications. These rejections must be corrected and the file resubmitted. The user should select the View link for detailed information.

*If additional information or assistance is needed, please select the [Feedback and Support](#) option in the dashboard and submit a request.

Search By FileName

Enter file name

Entries 10

UPLOADED ON	DATA SUBMITTED BY	FILENAME	STATUS
9/30/2024	University of Iowa	1041130_20240930190434_UIHC_MsTR_BaselineV6.xlsx.pgp	Success
9/24/2024	University of Iowa	1041130_20240924141412_UIHC_MsTR_EncounterV5.xlsx.pgp	Partial Case
9/23/2024	University of Iowa	1041130_20240923161006_UIHC_MsTR_EncounterV4.xlsx.pgp	All Cases Rej

Once data submitted to the registry, check Registry Insights for any processing issues.

- If file does not show on homepage within 24 hours of upload, check headers of file to ensure they match the MsTR data spec EXACTLY and resubmit. Processing of headers is case sensitive.
- If “Partial Case Rejection” and “All Cases Rejected” status, contact registry support for a more detailed explanation of rejections.

DASHBOARD FILTERS

Module
All

Institution
All

Age Group
All

Gender
All

Sarcoma Type
All

Primary Diagnosis
All

Extremity
All

Tumor Type
All

Encounter Date

- Select all
- 2024
- 2023
- 2022
- 2021
- 2020

Age Group

- All
- <=18
- 19-40
- 41-64
- >=65
- Unknown

Sarcoma Type

- All
- Bone
- Soft Tissue

Primary Diagnosis

- All
- Chondrosarcoma
- Ewings Sarcoma
- Fibrosarcoma
- Giant Cell Tumor
- Leiomyosarcoma
- Lipsarcoma
- Neural Sarcoma
- Not Reported/NR/Blank

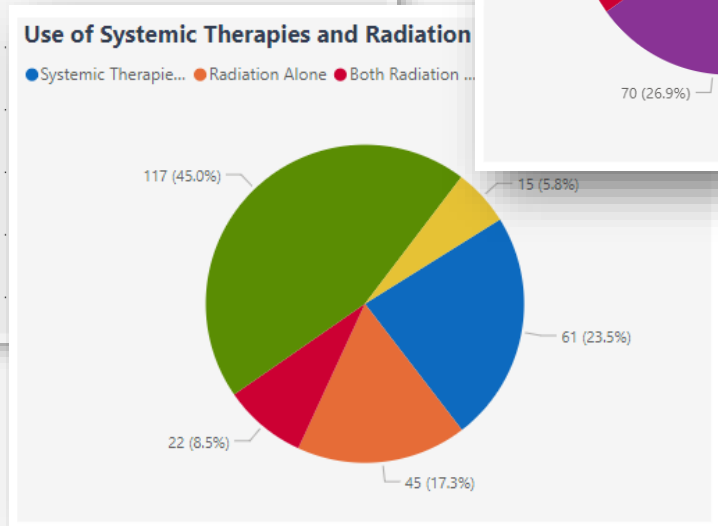
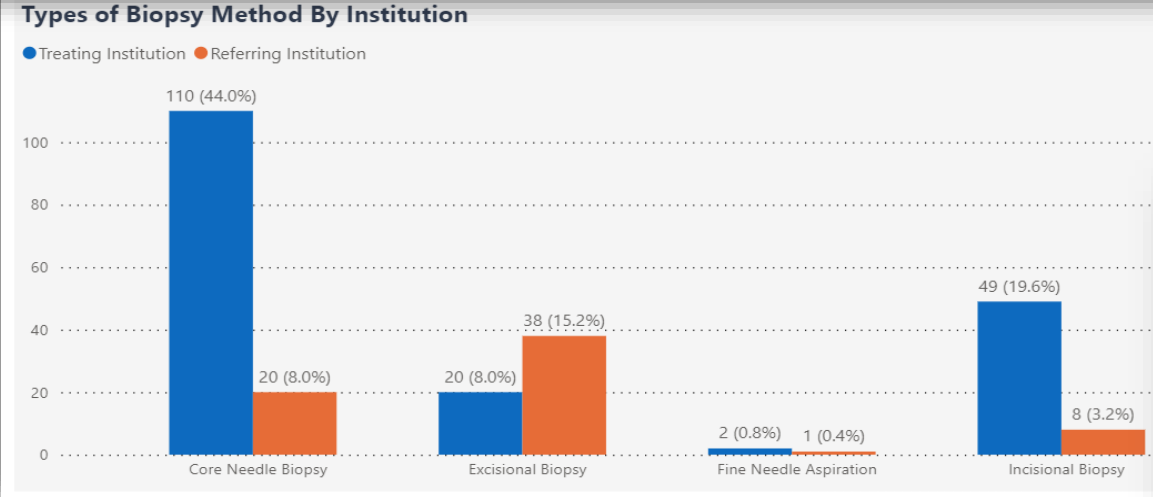
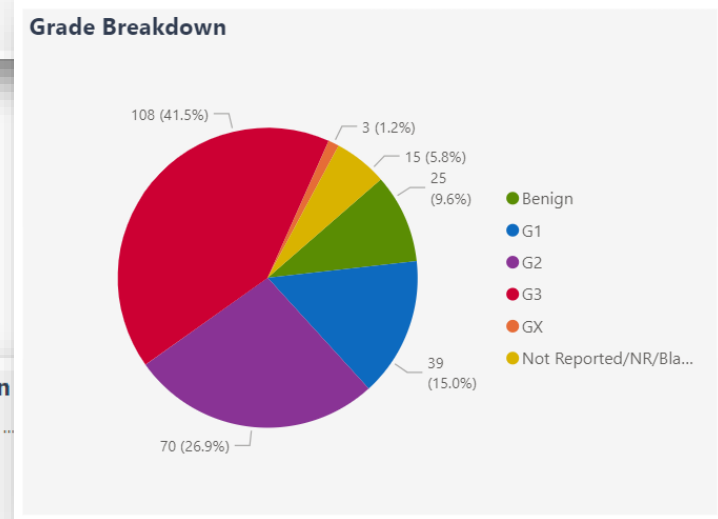
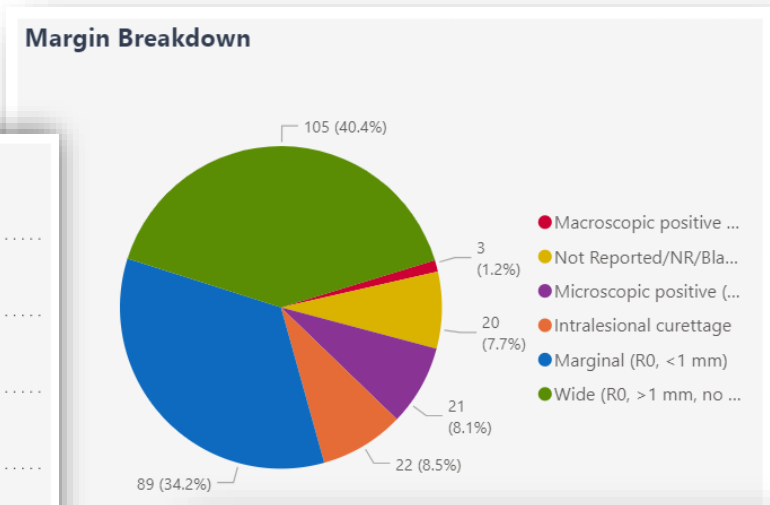
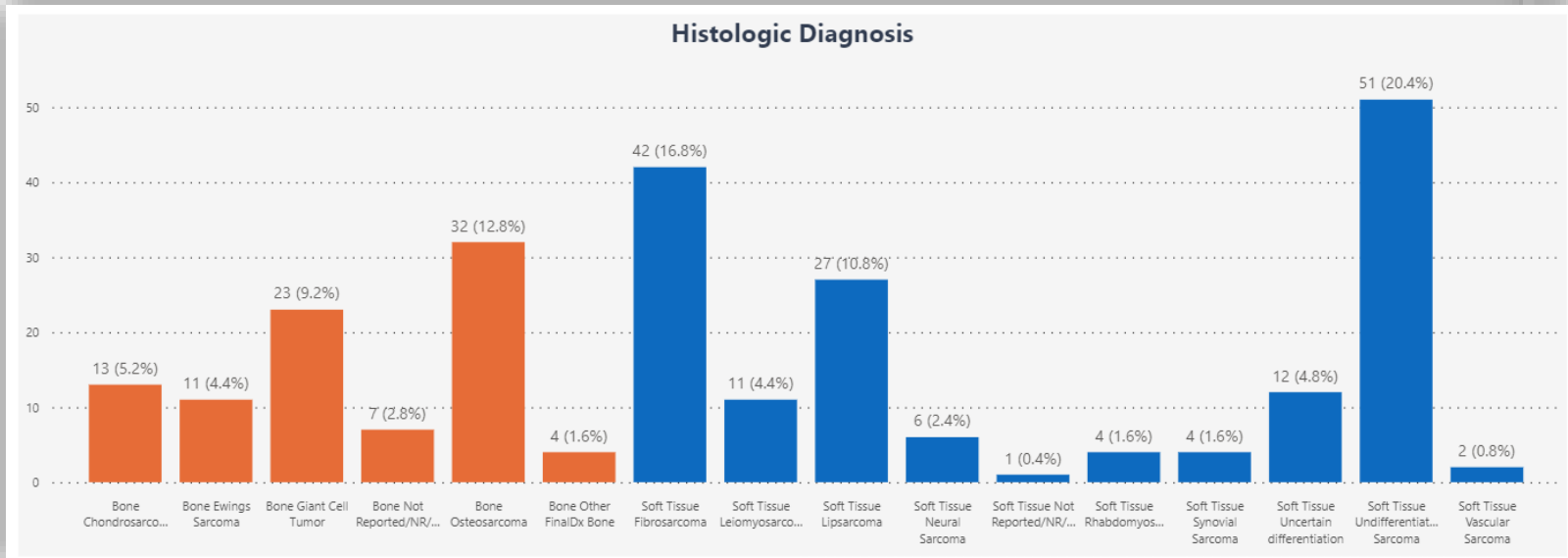
Extremity

- All
- Upper Extremity
- Not Reported/NR/Bl...
- Lower Extremity
- Axial

Tumor Type

- All
- Benign
- G1
- G2
- G3
- GX
- Not Reported/NR/Bl...

DASHBOARD VISUALS



MUSCULOSKELETAL TUMOR REGISTRY

QUESTIONS?