North Carolina Orthopaedic Association

2015 Annual Meeting

Closing Session

Sunday, October 11

October 9-11, 2015 • Kiawah Island Golf Resort
Kiawah Island, South Carolina

This continuing medical education activity is jointly provided by the NCOA and the Southern Regional Area Health Education Center
New Technologies for Total Joint Replacement

Ralph A. Liebelt, MD
Triangle Orthopaedic Associates
New Technology

Dynamic Balancing
Modified Instrumentation for Conventional Surgery
Robotics and Navigation
Patient-Specific and customized implants
3-D printing
Dynamic Balancing

Orthosensor: balancing based on direct recording of pressures within the tibial trial insert

Requires partnering with the major vendors to manufacture their inserts with the technology

Issues of additional cost, implementation and utility

Very useful as a training tool
Dynamic Balancing

Tissue Guided Surgery

TGS/ Mirror Unicompartmental Arthroplasty

Off of a standard tibial resection a tensor directs a router to prepare the contour of the femur to obtain isometry of the collateral throughout the arc of motion

Latest generation of instruments currently being released

Extensive clinical experience by one surgeon, Jerry Engh with excellent clinical results
Robotics/Navigation

Active
Semiactive
Passive (traditional navigation)
NFC (Navigated Freehand Bone Cutting)
Robotics/Navigation

Passive (traditional navigation)
When part of a robotic system requires no active role for the computer
Clearly demonstrated to reduce outliers, improved accuracy and precision
Very little clinical data which suggests improved outcomes....Does alignment correlate with outcomes?
Useful for extra-articular deformity and retained hardware where conventional techniques may be compromised
Many systems gathering dust at this point
Passive Navigation

GPS- Exactech
Infrared sensors, improved registration with a multitude of algorithms for workflow including gap-balancing
Reasonable cost
Implant specific
Accuracy and precision validated
Clinical studies on-going
Active Robotics

ROBODOC now ThinkSurgical
CASPAR
A few legacy systems
Active Robotics

Some systems have been around for 20 years, including about 25 in use in Europe.
Adoption has been spotty.
Thinksurgical has reworked the preoperative and intraoperative paradigm.
Now available for THR and soon for TKR.
Other platforms will be forthcoming.
Creative ways to recapture upfront costs.
Clinical data showing improved outcomes still lacking.
Active Robotic Surgical Workflow

CT Scan
Patient

TPLAN
Pre-Surgical Planning

TCAT
Active Implementation
Core Technology TKA Results

More accuracy in limb alignment\(^1,2,3,4,5,6,7,8\)

Less post-operative bleeding\(^6,7\)
   Active Robotics: 613 ± 318 mL
   Conventional: 933 ± 467 mL

Improved flexion-extension gaps\(^6\)
   Active Robotics: 6% (flexion gap – extension gap) > 2mm,
   Conventional: 20% (flexion gap – extension gap) > 2mm

More accurate transverse plane femoral rotational alignment
   Active Robotics: range 0.02° to 1.15° (mean: 0.52°)
   Conventional: range 0.32° to 4.13° (mean: 2.76°)
Core Technology THA Results

No intraoperative femoral fractures
   Active Robotics: 0/75
   Conventional: 5/71

Improved implant-bone interface contact
   Active Robotics: 96%
   Conventional: 21%

Superior proximal loading and decreased stress shielding

Better anteroposterior alignment and vertical seating

Less leg length variance
   Active Robotics: range 0-12mm
   Conventional: range 0-29mm
Semiactive Robotics

MAKO RIO – haptic for Uni knee, THR and soon TKR

Acrobat Sculptor

PFS Blue Belt – for Uni knee
MAKO

Uni knee- Medial, Lateral, Patellofemoral and Bicompartmental
Total Hip Replacement- Available for Anterior and Posterior approaches
Soon Total Knee replacement
MAKO- Clinical Summary

Robotic THR cohort had Higher HHS, Lower dislocation rate... total 300 THR, one surgeon

Robotic cup placement more accurate than fluoroscopically guided

BMI did not affect results of Uni knee and cup placement in 2 separate studies

Robotic THR learning curve did not increase clinical complications

Multiple studies showing very low revision rates, both early and late

Some early studies suggesting improvement in clinical outcomes compared to traditional Uni
Blue Belt- PFS

- Imageless registration
- All controls in the cutter
- Less bulky platform
- Cost reduction
- Open platform
Navigated Freehand/ Smart-tools

Based on preop 3-D imaging or computer navigation
Open platform
Potential lack of tactile feedback or issues with cutting eburnated bone
Likely less expensive
Somewhat patient specific
Many of these systems will be launched over the next couple years
Robotics- Advantages

- Improved implant placement and sizing
- Precision and accuracy
- Some may reduce OR time (e.g., THR MAKO)
- Allow a great deal of latitude in developing the surgical plan
- Some clinical studies which suggest reduced early complications related to technical issues
- With THR we now have a tool to allow us to begin to study how to customize cup orientation, combined anteversion etc for the patient. Rather than a “safe zone” we could orient based on sagittal alignment, spine issues, ligament issues, etc.
Robotics - Disadvantages

Cost, cost, cost....
Potentially steep learning curve
Additional personnel in the OR, setup time, instruments
Implant specificity, closed platforms, but conventional implants
Mechanical or electrical failures, plans for backup
Preop imaging...radiation, cost, ect
Cannot correct for a flawed preop plan
Patient Specific-Custom Implants

PSI has been around for many years with variable adoption
Cost savings questionable
Clinical Outcomes not definitively improved
The addition of a custom implant makes this potentially truly patient specific
Why Customized Implants?
Understanding Principle Drivers of Dissatisfaction

Early Implant Failure
- Leg alignment
- Poly wear
- Implant engineering

Early failures only 1-2%, but significant when they occur

Residual Pain
- Component fit
- Internal rotation of the femur/tibia

10-15% of TKA patients have clinically significant residual pain\(^1,2\)

Compromised Function
- Limited range of motion & stiffness
- Knee instability
- Proprioception

Dissatisfied patients report that their knee does not feel normal at more than 2x the rate of satisfied patients\(^3\)

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Comparison of 100 iTotal TKRs to 100 OTS (Off The Shelf) implants with conventional instruments

• iTotal was **1.8 times more likely** to be within +/- 3 degrees neutral mechanical alignment
Personalized Position, Shape & Fit

Patient matched, anatomic femur to avoid sizing compromises

Personalized fit can help avoid soft tissue issues such as (e.g., popliteus tendon “popping”), which traditionally would require releases to correct.¹

¹ Barnes, C.L., Scott, R.D.; Popliteus Tendon Dysfunction Following Total Knee Arthroplasty; J Arthroplasty; 1995; Vol. 10; No. 4, pp. 543-545.
Personalized Position, Shape & Fit
*Patient matched, anatomic femur to avoid sizing compromises*

Symmetric total knee designs force compromises between complete coverage and overhang. Variations in anatomy make it virtually impossible to fit in all areas of the femur.

3-D fit, not just A/P and M/L

No sizing compromises
Internal rotational error of the tibial component is a major cause of pain after total knee replacement.

This study used CT analysis to determine the rotational alignment of 39 painful and 26 painless fixed-bearing total knee replacements (TKRs) from a cohort of 740 NexGen Legacy posterior-stabilised and cruciate-retaining prostheses implanted between May 1996 and August 2003.

The mean rotation of the tibial component was 4.3° of internal rotation (25.4° internal to 13.9° external rotation) in the painful group and 2.2° of external rotation (8.5° internal to 18.2° external rotation) in the painfree group ($p = 0.024$). In the painful group 17 tibial components were internally rotated more than 9° compared with none in the painfree group ($p < 0.001$). Additionally, six femoral components in the painful group were internally rotated more than 6° compared with none in the painfree group ($p = 0.017$). External rotational errors were not found to be associated with pain.

Overall, 22 (56.4%) of the painful TKRs had internal rotational errors involving the femoral, the tibial or both components. It is estimated that at least 4.6% of all our TKRs have been implanted with significant internal rotational errors.

J Bone Joint Surg BR. 2010;92-B:1238-44
Personalized Position, Shape & Fit

Designed for proper rotation and fit to avoid known causes of pain

Rotational Alignment

Center of baseplate set to the center of the medial and lateral condyles, shown to be a reliable method of tibial component rotation\(^1,2\).

Patient-Specific Shape & Fit

Implant profile is then matched to cortical rim, with slight relief to allow +/- 5\(^\circ\) intra-operative adjustment without implant overhang, a potential source of pain\(^3\).

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2 Lützner et al.: Rotational alignment of the tibial component in total knee arthroplasty is better at the medial third of tibial tuberosity than at the medial border. BMC Musculoskeletal Disorders, 2010 11:57.
Respect Patient’s Condylar Geometry

iShape™ Sagittal ‘J’ Curves

Studies have also shown that standard TKR geometry, including single radius designs, alter knee kinematics.\(^1\) With iTotal, the patient’s anatomic ‘J’ curves, corrected for deformity, provide the basis for the implant design.

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Femur Matched Offset Polys
Facilitates proper balancing of offset femur and joint line

Separate medial and lateral poly inserts matched to femoral offset

Offset helps mimic varus angle of normal tibial plateau

Medial insert more conforming than lateral insert to facilitate rollback

3 lateral thicknesses (medial+offset)
3 medial insert options (6, 7, and 8mm)

X-rays show two legs with different offsets, but both aligned to neutral mechanical axis
In Vivo Kinematics for Subjects Implanted With Either a Traditional or Personalized TKA

Komistek, ICJR Pan Pacific 2014

• Single surgeon series
• Two different types of CR TKA
  *Customized Individually Made (CIM)*
  *Off-the-Shelf (OTS)*
• First study to utilize mobile fluoroscopy
• Deep knee bend to max flexion

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1 Komistek. In Vivo Kinematics for Subjects Implanted With Either a Traditional or a Customized, Individually Made TKA. ICJR Pan Pacific 2014 Annual Meeting. Poster #O21A2
Intercondylar notch width driven by patient anatomy rather than need to accommodate upsizing and downsizing.

Wide coronal geometry for high conformity to poly with low constraint.

Lowered lateral trochlea to decompress soft tissue.

Single radius dome patellofemoral joint.

Extended trochlear groove to guide patella in deep flexion.

Intercondylar notch width driven by patient anatomy rather than need to accommodate upsizing and downsizing.

Engineered Design Features

Wear optimization and engineered function
Customized Implant “Delivery Model”
A Model for a More Efficient Joint Replacement System

Patient imaging study at validated center

Implant Request Form (IRF) submitted

3D Image processing

Implant & iJig® design & manufacture

One package delivered for Surgery

6 Week Delivery Time
Customized Implant “Delivery Model”
Efficient, Pre-Sterilized, Disposable

Single use kit delivered a few days before surgery

One reusable instrument tray

iTTotal G2 instrument set and implants provided for use in the OR
True Patient Specific Fit and Shape
3-D Printing

Custom implants for filling bone defects...custom revision augments for TKR, THR
Conformis utilizing for it’s cutting blocks and implants
As it becomes more economical, may be able to develop “live” implant production.
New ingrowth surfaces, better flexural rigidity for implants.
New Technology- Summary

Several new platforms have been and are being added which may improve outcomes.

Cost implications have to be considered until we have some reasonable proof of the benefit of these technologies as we are all getting squeezed to save, yet being held more accountable for some issues we have little control over.

More clinical data over longer followup will be needed to sort out the cost-benefit.

The Vendors need to take more responsibility for funding these studies to validate their technology/implants.
Thank you
Navigating the Visit Navigator – How to Get Through a day at the Office with Epic EMR

Cynthia L. Emory, M.D., Wake Forest School of Medicine
Joe Minchew, M.D., Duke University Health System
North Carolina Orthopaedic Association Annual Meeting, October 11, 2015
"I hear there's a new ICD-10 code for carpal tunnel syndrome caused by clicking too many times in an EMR system."
### BestPractice Advisories

Refresh: Last refreshed on 9/13/2015 at 5:58 PM

### Problem List

- **Create Patient Care Coordination Note**
- **Add a new problem**: Add
- **List View**: Class, Do not group, Orthopedic Problems, Priority, Status, System
- **Choose Columns**: Diagnosis, Orthopedic Problems, Mark as Reviewed, Never Reviewed

#### Orthopedic Problems

- **Closed tibia fracture**

#### Visit Diagnoses

- **Search for new item**: Add
- **Common**: Aftercare - tumor pos, Neoplasm, Bone tumor, Soft tissue sarcoma, Lipoma
- **Bone metastasis**: Endochondroma, Osteochondroma, Lipoma
- **Multiple myeloma**: Non-ossifying fibroma, Ganglion

- **None**
### Orthopedic Problems

**Closed displaced fracture of medial malleolus of right tibia**

- **Unprioritized**

  - **Details**: Code 824.0, Noted 09/13/2015
  - **Share w/ Pt**: ✓
  - **Options**: Change Dx, Resolve

### Visit Diagnoses

1. **Closed displaced fracture of medial malleolus of right tibia, initial encounter**
   - ICD-10-CM: S82.511A
   - ICD-9-CM: 824.0
   - **Options**: Change Dx
Closed displaced fracture of medial malleolus of right ankle

MVA 9/13/15. - s/p ORIF with cannulated screws 9/14/15. NWB x 6 weeks in tx boot, then start PT.
Insert text from overview into plan
Insert text from overview into plan.
No current outpatient prescriptions on file.

Physical Exam:
Physical Exam
Ortho Exam

Vitals: There were no vitals filed for this visit.

Special Investigations - Review of Diagnostic Tests:

Radiologic Studies: [WH ORT RAD/LAB REVIEWED: 29208]
Lab Studies: [WH ORT LAB STUDIES: 28210]

Assessment:
1. Closed displaced fracture of medial malleolus of right fibula, initial encounter.

Plan:

Patient Active Problem List:
Diagnosis: Closed displaced fracture of medial malleolus of right fibula.
Date Noted: 09/13/2015.

Overview Note:
MVA 9/13/15. s/p ORIF with cannulated screws 9/14/15.
NWB x 6 weeks in fx boot, then start PT.

Follow up: No follow-up on file.
Date of Surgery: 09/19/2015
Pre OP Diagnosis: Closed (RIGHT/LEFT:202394) (FRACTURE PATTERN:97823142) supracondylar humerus fracture, ICD-9 812.41
Post OP Diagnosis: same
OP Procedures: Closed reduction with percutaneous skeletal fixation (RIGHT/LEFT:202394) humerus, CPT 24538
Surgeon: Cynthia L Emory, MD
Assistant(s): ***
Anesthesia: general
Position: supine
Complications: none
Time out: Performed
Drains / Packing: none
Tourniquet: No
Estimated Blood Loss: Minimal
Returned to recovery room: Good
Prophylactic Antibiotics: Yes
Mechanical VET (DVT) Prophylaxis: Not Indicated
Specimens Removed: 0
Sponge and instrument count correct: yes
Disposition: admitted to the hospital

Indications for Procedure:
The patient is a *** yo (Desc; male/female:11659) with a displaced (RIGHT/LEFT:202394) supracondylar humerus fracture. Risks and benefits of the surgery were discussed with the patient's family in detail. Alternatives to surgery were discussed with the patient's family. Specifically risks of surgery included bleeding, infection, damage to surrounding nerves and vessels, growth disturbance, failure of fracture fixation, malunion, nonunion, DVT, pulmonary embolism, stroke, heart attack, and death. After risks and benefits of surgery were discussed with the patient's family in detail, they elected to proceed with surgery.

Description of Procedure in Detail:
The patient was identified in the preoperative holding area. The correct site was confirmed with the patient's family and marked on the patient. The patient was brought to the operating room and administered General anesthesia. Routine prep and drape was performed of the left upper extremity. A time out procedure was performed identifying the correct patient, correct operative site as well as medication allergies. Prior to Incision IV antibiotics were administered.

Radial pulse palpable. Intraoperative fluoro was utilized for visualization of the elbow. Closed reduction maneuver consisting of traction followed by flexion of the elbow with manipulation of the fracture was performed. Satisfactory reduction was performed. (NUMBERS 1-3-24940) lateral diverging 0.062 mm K-wires were advanced across the fracture to stabilize the fracture. Intraoperative fluorescopy was used to verify appropriate pin placement. Elbow stable under range of motion testing under lateral view using live fluoro. Pins were bent and cut, and felt was placed around the pins.
Sterile dressings were applied. Patient placed into long arm cast. The patient was awakened and transferred to the recovery room in stable
Date of Surgery: 09/13/2015
Pre OP Diagnosis: Closed right [FRACTURE PATTERN:97823142] supracondylar humerus fracture, ICD-9 812.41
Post OP Diagnosis: same
OP Procedures: Closed reduction with percutaneous skeletal fixation [LEFT:20294] humerus, CPT 24538
Surgeon: Cynthia L Emory, MD
Assistant(s): ***
Anesthesia: general
Position: supine
Complications: none
Time out: Performed
Drains / Packing: none
Tourniquet: No
Estimated Blood Loss: Minimal
Returned to recovery room: Good
Prophylactic Antibiotics: Yes
Mechanical VET (DVT) Prophylaxis: Not Indicated
Specimens Removed: 0
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Description of fracture:

{FRACTURE CLASSIFICATION - GUSTILO/CLOSED:24554}
{FRACTURE PATTERN:97823142}
{FRACTURE CLASSIFICATION - HIP:97823145}
{FRACTURE CLASSIFICATION - SALTER HARRIS:97823143}
{FRACTURE LOCATION WITHIN BONE:97823141}
Description of fracture:
{FRACTURE CLASSIFICATION - GUSTILO/CLOSED:24554}
{FRACTURE PATTERN:97823142}
{FRACTURE CLASSIFICATION - HIP:97823145}
{FRACTURE CLASSIFICATION - SALTER HARRIS:97823141}
{FRACTURE LOCATION WITHIN BONE:97823141}

Gustilo classification
Fracture pattern

Description of fracture:
Closed

{FRACTURE PATTERN:97823142}
{FRACTURE CLASSIFICATION - H: other}
{FRACTURE CLASSIFICATION - S: other}
{FRACTURE LOCATION WITHIN B: transverse, spiral, comminuted, oblique, segmental, greenstick, longitudinal, other}

FRSIS:97823143
3141
Description of fracture:
Closed oblique

{FRACTURE CLASSIFICATION - HIP:97823145}
{FRACTURE CLASSIFICATION - SALTER HARVARD}
{FRACTURE LOCATION WITHIN BONE:97823145}

midcervical
basicervical (base of neck)
intertrochanteric
subtrochanteric
greater trochanter
lesser trochanter
apophyseal
ephyseal
articular surface of head

Hip fracture specifics
Description of fracture:
Closed
oblique
basicervical (base of neck)

{FRACUTRE CLASSIFICATION - SALTER HARRIS:97823143} 

Salter-Harris Type I (through physis)
Salter-Harris Type II (physis and metaphysis)
Salter-Harris Type III (physis and epiphysis)
Salter-Harris Type IV (metaphysis, physis, and epiphysis)
Salter-Harris Type V (cuff injury to physis)
Description of fracture:
Closed oblique basicervical (base of neck)
Salter-Harris Type II (physis and metaphysis)

{FRACUTURE LOCATION WITHIN BONE:97823141}
Description of fracture:
Closed
oblique
basicervical (base of neck)
Salter-Harris Type II (physis and metaphysis)
physeal
Meaningful Use – Patient Portal Tips

• Set up login & password in the office
• Send follow up message that day or next day
• Use distribution list to send blast to multiple patients
  • Ex: bone health evaluation for all patients age ≥ 50
EMR Efficiency
Oxymoron or Unicorn?
Joe T. Minchew, MD

Associate Professor
Department of Orthopaedic Surgery
Duke University Health System
Disclosures

• EPIC
  • Chairman, Adult Orthopaedic Steering Board
  • Advisory, non-financial
Well........

• Yes
• Yes
• Yes
• Maybe not
  • Put in time and effort prior to implementation
  • You can pay me now or pay me a lot later
• Try to identify places where you can leverage software
• 80-20 or 90-10 scenarios
  • Follow up patients
  • Postop patients
  • Procedure reports
EMR Efficiency

• Prior to Implementation
  • Identify pertinent available content
  • Identify content deficiencies that must be addressed
    • Who is committing the resources to rectify
  • Exam existing workflows and assess potential impact/changes
  • Establish concept that everyone must work/function up to the highest level of their abilities/scope of practice
    • Can’t (or won’t) do it- Is it system “model” or local decision
    • Design workflows, forms, etc. to incorporate this concept.
    • “Make me author”
# EMR Efficiency

<table>
<thead>
<tr>
<th>Name</th>
<th>Short Description</th>
<th>ID</th>
<th>Owner</th>
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<tbody>
<tr>
<td>ACDERDOPSTOPPLAN</td>
<td>Plan for postop ADA 3rd visit</td>
<td>131056</td>
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<td>COCCYIDURJTM</td>
<td>Coccygeal injection note</td>
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<td>Comprehensive cervical exam</td>
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<td>History for follow up cervical patient</td>
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<td>History for follow up cervical patient (temporary)</td>
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<td>History and examination for cervical postop fusion</td>
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<td>Davis operative note for bilateral, multilevel intra-articular facet injections</td>
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<td>Chart note for IME patients</td>
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<td>Operative technique for IM nailing of tibia</td>
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<td>Procedure: Carpal Tunnel Corticosteroid Injection</td>
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<td>MITANI, SUHAIL K</td>
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<td>Template for posting injections</td>
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<td>INTJHM</td>
<td>Initial History Patient Form JTM</td>
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<td>JTMURMEOCNOTE</td>
<td>Bilateral lumbar microdiscectomy operative note</td>
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<tr>
<td>JTMRMUDOCNOTEBASE</td>
<td>Davis Injection Or Note Base</td>
<td>219693</td>
<td>MINCHEW, J东北 T</td>
</tr>
<tr>
<td>Competency Definition</td>
<td>Clinical staff</td>
<td>Provider</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>Enters reason(s) for visit.</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enters vital signs (BP, height, weight, pain score and Mark as Reviewed.</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Update Allergies and Mark as Reviewed.</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completes Med Reconciliation and Mark as Reviewed.</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verifies/updates Pharmacy Information.</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Updates Past medical history, past surgical history, past family history and social</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>history and Mark as Reviewed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Documents Falls Risk.</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Documents Tobacco Use and Mark as Reviewed.</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review of Systems: Documents a patient-reported ROS.</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enters order (if applicable), including but not limited to:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Referrals (PT, OT, Pain clinic etc)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- CT/MRI/XR orders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Injection orders and documents on MAR (protocols shared to staff)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Labs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Medications (favorites/protocols should be shared to clinic staff)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maestro Workflow Responsibilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enters patient instructions from ExitCare or via SmartPhrase. <em>(if provider shares the necessary information- Smart Phrases or preferred Exit Care info)</em></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enters Follow-Up information</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prints AVS and discharges patient from room</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completes Refill Encounters (based on phone calls) PRN</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completes Telephone Encounters PRN</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication Reconciliation – press Mark as Reviewed</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enters Problem on the Problem List (and pushes the Problem to Diagnosis section) and Mark as Reviewed</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completes all sections of Progress Note.</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enters LOS and Charge Capture for visit- to be revisited within 90 days</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closes the Encounter <em>(at the end of the AM and PM sessions- after all documentation above has been completed)</em></td>
<td>x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
EMR Efficiency

Orthopaedic Spine Follow Up Visit

History of Present Illness:
Froghirteen Test presents today for follow up of {lumbar cc:23003}; this problem has {status :23695}. She complains of { :24390}. She reports {new injury? :23696}. She describes current symptoms as: {quality :23017}, {severity :23014}, and {duration :23016}. Pain score is { :10902}. She reports {weakness? :23033}. She reports {Numbness:12875::"no numbness","numbness in the"} {torso/legs :23029}. She reports {Numbness:12875::"no paresthesias","paresthesias in the"} {torso/legs :23029}. She reports {bowel, bladder, sexual dysfunction?:23039}. Since her last visit, she has tried {meds :24391} {results:23697}. Since her last visit, she has tried {tx :23040} that helped the pain. Since her last visit, she has tried {tx :23040} that has not helped the pain. She {work status :23047::"is working with restrictions","is working without restrictions"}.

Review of Systems:
A comprehensive review of systems is { :25260::"documented elsewhere in the encounter"}.

Past Medical History:
I have reviewed past medical, surgical, social and family history, medications and allergies as documented in the EMR.
EMR Efficiency

Patient Name: ___________________________ MRN: ___________ DOS: ___________

L-Spine Follow-Up or T-Spine Follow-up

WHAT IS YOUR MAIN COMPLAINT?

Involved Area (Check only one)
- Back
- Left leg pain (Check Laterality)
- Right leg pain
- Pain in both legs

SINCE YOU LAST VISIT:

1.) Has this problem (Check One)
   Resolved
   Mildly improved
   Moderately improved
   Significantly improved
   Remained the Same
   Mildly worsened
   Moderately worsened
   Severely worsened

Is this still your main problem (Circle One)? (Yes) (No)
EMR Efficiency

History of Present Illness:
Froghirteenth Test presents today for follow up of left leg pain; this problem has \{status:23695\}. She complains of \{new injury?:23696\}. She describes current symptoms as: \{quality:23016\} and \{duration:23016\}. Pain score is \{10902\}. She reports \{weakness?:23033\}. She reports \{numbness","numbness in the"\} \{torso/legs:23029\}. She reports \{Numbness:12875:"no pares in the"\} \{torso/legs:23029\}. She reports \{bowel, bladder, sexual dysfunction?:23039\}. Since her last visit, she has tried \{meds:24391\} \{results:23697\}. Since her last visit, she has tried \{tx:23040\} that helped the pain. Since her last visit, she has tried \{tx:23040\} that has not helped the pain. She \{work status:23047:"is working without restrictions"\}.

Review of Systems:
A comprehensive review of systems is \{25260:"documented elsewhere in the encounter"\}.
2.) Do you have any related symptoms or pain (Check all that apply):
   No Associated Symptoms (skip to question # 4.)
   Neck Pain: ______ (where?)
   Shoulder Pain: (Left) (Right) (Both)
   Arm Pain: (Left) (Right) (Both)
   Shoulder Blade: (Left) (Right) (Both)
   Pain between the neck and shoulder (Left) (Right) (Both)
   Back Pain ______ (where?)
   Leg Pain: (Left) (Right) (Both)
   Other ____________________________

3.) Have these symptoms (Check One)?:
   Resolved
   Mildly Improved
   Moderately Improved
   Significantly Improved
   Remained the Same
   Mildly Worsened
   Moderately Worsened
   Severely Worsened
EMR Efficiency

History of Present Illness:
Froothirteen Test presents today for follow up of left leg pain; this problem has [status:23695]. She complains of [24390]. She reports {new injury?:23696}. She describes current symptoms as: {quality:23017}, {severity:23014}, and {do no associated symptoms or pain}. She reports {numbness:12875}"no numbness" associated {cervical pain:23707}; this problem has {23695} associated {TL pain:23004}; this problem has {23695} tried {m***}. Since her last visit, she has tried {tx:23040} that has not helped the pain. Since her last visit, she has tried {tx:23040} that has not helped the pain. She {work status:23047}"is working with restrictions", "is working without restrictions".
# EMR Efficiency

**DESCRIBE YOUR SYMPTOMS:**

<table>
<thead>
<tr>
<th>Quality (Check All That Apply):</th>
<th>Severity (Check One)</th>
<th>Duration (Check One)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aching</td>
<td>Mild</td>
<td>Constant</td>
</tr>
<tr>
<td>Cramping</td>
<td>Moderate</td>
<td>Intermittent</td>
</tr>
<tr>
<td>Dull</td>
<td>Severe</td>
<td>Occasional</td>
</tr>
<tr>
<td>Electrical</td>
<td>Intense</td>
<td>Improving</td>
</tr>
<tr>
<td>Radiating</td>
<td>Unremitting</td>
<td>Worsening</td>
</tr>
<tr>
<td>Sharp</td>
<td>Mild to Moderate</td>
<td>Constant w/ intermittent worsening</td>
</tr>
<tr>
<td>Superficial (skin)</td>
<td>Mild to Severe</td>
<td>Unchanged</td>
</tr>
<tr>
<td>Squeezing (pressure)</td>
<td>Moderate to Severe</td>
<td>Other</td>
</tr>
<tr>
<td>Other:</td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

---
**EMR Efficiency**

**History of Present Illness:**
Frognthirteen Test presents today for follow up of left leg pain; this problem has \{status:23695\}. She complains of \{24390\}. She reports \{new injury?:23696\}. She describes current symptoms as: \{quality:23017\}, \{severity:23014\}, and \{duration:23016\}. Pain score is \{10902\}. She reports \{weakness?:23033\}. She reports \{numbness\}, \{numbness in the\} \{torso/legs:23029\}. She reports \{Numbness:12875\} \{no paresthesia in the\} \{torso/legs:23029\}. She reports \{bowel, bladder, sexual dysfunction?:23039\}. Since her last visit, she has tried \{meds:24391\} \{results:23697\}. Since her last visit, she has tried \{tx:23040\} that helped the pain. She \{work status:23047\} \{is working without restrictions\}.  

**Review of Systems:**
A comprehensive review of systems is \{25260\} \{documented elsewhere in the encounter\}.
EMR Efficiency

History of Present Illness:
presents today for follow up of bilateral leg pain; this problem has moderately improved. She complains of associated associated back pain; this problem has moderately improved. She reports no new injury or accident. She describes current symptoms as: aching and radiating, moderate, and constant. Pain score is 4/10. She reports no weakness. She reports no numbness bilaterally. She reports no paresthesias bilaterally. She reports no bladder, bowel or sexual dysfunction. Since her last visit, she has tried Neurontin, Ultracet with moderate improvement. Since her last visit, she has tried home exercises, physical therapy, massage that helped the pain. Since her last visit, she has tried nothing known to patient that has not helped the pain. She has returned to work full-time without restrictions.

Review of Systems:
A comprehensive review of systems is documented elsewhere in the encounter).

Past Medical History:
I have reviewed past medical, surgical, social and family history, medications and allergies as documented in the EMR.

Physical Exam:
General/Constitutional: 24064: "No apparent distress; well-nourished and well developed."
Eyes: 24065: "Pupils equal, round with synchronous movement."
Lymphatic: 24066: "No adenopathy."
Respiratory: 24067: "Non-labored breathing."
Vascular: 24068: "No edema, swelling or tenderness, except as noted in detailed exam."
Integumentary: 24069: "No impressive skin lesions present, except as noted in detailed exam."
Neuro/Psych: 24070: "Normal mood and affect, oriented to person, place and time."
EMR Efficiency

Orthopaedic Spine Follow Up Visit

History of Present Illness: presents today for follow up of bilateral leg pain; this problem has moderately improved. She complains of associated back pain; this problem has moderately improved. She reports no new injury or accident. She describes current symptoms as aching and radiating, moderate, and constant. Pain score is 4/10. She reports no weakness. She reports no numbness bilaterally. She reports no paresthesias bilaterally. She reports no bladder, bowel or sexual dysfunction. Since her last visit, she has tried Neurontin, Ultracet with moderate improvement. Since her last visit, she has tried home exercises, physical therapy, massage that helped the pain. Since her last visit, she has tried nothing known to patient that has not helped the pain. She has returned to work full-time without restrictions.

Review of Systems: A comprehensive review of systems is {"25260":"documented elsewhere in the encounter"}.

Past Medical History: I have reviewed past medical, surgical, social and family history, medications and allergies as documented in the EMR.
EMR Efficiency

Progress Notes

Do you want to become the author responsible for this note?

Warning: You are about to become the author of this note.

Current Author: Susan Furr, CMA

- Hip: 23989
- Spine Imaging:
  The following spine:
  24059
- Assessment:
  No diagnosis found
- Plan:
  The patient was prescribed "no medications". Milissa was referred for "no new treatments". She had diagnostic tests ordered before next visit. She needs referrals.
  Surgery indicated? 23764. Regarding work status, patient is 23766. Follow-up in number 18281 units 230005. She needs diagnostic tests to be performed on her return visit.
EMR Efficiency

Hip:
{Hip :23989}

Spine Imaging:
The following spine imaging studies were reviewed today; findings are as indicated:
{::24059}

Assessment:
No diagnosis found.
EMR Efficiency

History of Present Illness:

presents today for follow up of bilateral leg pain; this problem has moderately improved. She complains of associated associated back pain; this problem has moderately improved. She reports no new injury or accident. She describes current symptoms as: aching and radiating, moderate, and constant. Pain score is 4/10. She reports no weakness. She reports no numbness bilaterally. She reports no paresthesias bilaterally. She reports no bladder, bowel or sexual dysfunction. Since her last visit, she has tried Neurontin, Utracet with moderate improvement. Since her last visit, she has tried home exercises, physical therapy, massage that helped the pain. Since her last visit, she has tried nothing known to patient that has not helped the pain. She has returned to work full-time without restrictions.

Review of Systems:

A comprehensive review of systems is documented elsewhere in the encounter.

Past Medical History:

I have reviewed past medical, surgical, social and family history, medications and allergies as documented in the EMR.
### EMR Efficiency

<table>
<thead>
<tr>
<th>Abbrev</th>
<th>Expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>TROCHINJBILJTM</td>
<td>Trochanteric Injection Note Bilateral</td>
</tr>
<tr>
<td>TROCHINJUNIJTM</td>
<td>Trochanteric Injection Note Unilateral</td>
</tr>
</tbody>
</table>

This note was generated in part with voice recognition software and I apologize for any typographical errors that were not detected and/or corrected.
**EMR Efficiency**

**Procedure Note**
Trochanteric Injection

**Indications**
She has trochanteric bursitis pain that has been resistant to other conservative measures. The risks, benefits and alternatives of the proposed procedure were discussed with her. She states they understand these and verbally consents to proceed.

**Description of Procedure**
The point of maximal tenderness over the trochanter was determined and marked. Her [Left/right:33004] greater trochanteric region was prepped with iodine. Topical skin anesthetic was obtained using ethyl chloride spray. Using aseptic technique 4.5 ml of 1% Lidocaine without epinephrine, 4.5 ml of 0.25% Bupivacaine without epinephrine and 1 ml of Depo Medrol 80 mg/ml was injected into the trochanteric bursa with a 22 gauge needle. She tolerated procedure well. She was counseled as to expected post injection course, including the possibility of temporary worsening of symptoms. She was instructed as to concerning symptoms or signs and instructed to contact the office if these should appear.
EMR Efficiency

Orthopaedic Spine Postoperative Visit

History of Present Illness
Date of Surgery: 06/18/15
Procedure: Microdecompression L4-L5 on the right, L5-S1 on the right.

Presents today for post-op follow-up. She reports doing poorly due to pain problems. The pre-op right leg pain has significantly improved. Her chief complaint at this point is low back pain. She reports no preop numbness/paresthesia. She reports no preop weakness. The wound has been healing without problems. She has been using Oxycodeone intermittently. She is able to perform ADL’s. She is retired.

Review of Systems:
A comprehensive review of systems is documented elsewhere in the encounter.

Past Medical History:
I have reviewed past medical, surgical, social and family history, medications and allergies as documented in the EMR.

Physical Exam:
General/Constitutional: No apparent distress; well-nourished and well developed.
Eyes: Pupils equal, round with synchronous movement.
Lymphatic: No palpable axillary adenopathy.
Respiratory: Non-labored breathing.
Vascular: No edema, swelling or tenderness; except as noted in detailed exam.
Integumentary: No impressive skin lesions present; except as noted in detailed exam.
Neuro/Psych: Normal mood and affect, oriented to person, place and time.
Musculoskeletal: Normal, except as noted in detailed exam and in HPI.

Post-Op Exam

<table>
<thead>
<tr>
<th>Post-Op</th>
<th>8 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>10/10</td>
</tr>
<tr>
<td>Wound</td>
<td>Healed without problems</td>
</tr>
<tr>
<td>Swelling</td>
<td>None</td>
</tr>
<tr>
<td>Tenderness</td>
<td>Moderate</td>
</tr>
</tbody>
</table>
EMR Efficiency

History of Present Illness:
Date of Surgery: 06/18/15
Procedure: Microdecompression L4-L5 on the right, L5-S1 on the right

presents today for post-op follow-up. She reports being generally well.
The pre-op right leg pain has significantly improved. Her lower back pain has significantly improved. She
reports no preop numbness/paresthesias. She reports no preop weakness. The wound has been healed. She
has been using [Pain: 23044] intermittently. She is able to perform ADL’s. She is retired.

Review of Systems:
A comprehensive review of systems was performed with no other complaints elsewhere in the encounter.

Past Medical History:
I have reviewed past medical history, medications and allergies as documented in the EMR.

Physical Exam:
General/Constitutional: No abnormalities. Broadly normal and well developed.
Eyes: Pupils equal, round with brisk responses to light. No afferent or efferent defect.
Lymphatic: No palpable axillary nodes or inguinal lymph nodes.
Respiratory: Non-laboring breath sounds.
Vascular: No edema, swelling or pulsatile masses.
Integumentary: No abnormal findings, except as noted in detailed exam.
Neuro/Psych: Normal mood and affect, thought processes normal, oriented to person, place and time.
Musculoskeletal: Normal, except as noted in detailed exam and in HPI.

Post-Op Exam

Cymbalta
Darvocet
Duragesic
Hydrocodone
Lidoderm 5% ADH patch
Lorcet
Methadone
MS Contin
OxyContin
OxyContin
Percocet
Peridex
Tylenol
Tylenol with codeine

**
EMR Efficiency

History of Present Illness:
Date of Surgery: 06/18/15
Procedure: Microdecompression L4-L5 on the right, L5-S1 on the right

She presents today for post-op follow-up. She reports being generally well. The pre-op right leg pain has significantly improved. Her lower back pain has significantly improved. She reports no pre-op numbness/paresthesias. She reports no pre-op weakness. The wound has been healed. She has been using [Pain 23044] intermittently. She is able to perform ADL’s. She is retired.

Review of Systems:
A comprehensive review of systems was performed and was negative at this moment and nowhere in the encounter.

Past Medical History:
I have reviewed past medical history, medications and allergies as documented in the EMR.

Physical Exam:
General/Constitutional: No apparent distress. Well developed and well developed.
Eyes: Pupils equal, round with brisk reactive to light.
Lymphatic: No palpable axillary or inguinal glands
Respiratory: Non-labored breath.
Vascular: No edema, swelling
Integumentary: No rashes, lesions or lacerations
Musculoskeletal: Normal, except noted in detailed exam.

Post-Op Exam

Cymbalta
Darvocet
Durasgesic
Hydrocodone
Lidoderm 5% ADH patch
Loracet
Lyrica
Methadone
MS Contin
Neurontin
OxyCodone
Oxycodine
Percocet
Tylenol
Tylenol with codeine
Ultracet
Ultram
Vicodin
Vicodin ***
EMR Efficiency

• Future
  • Patient entered medical information
    • EMR Web Portal
    • MyChart, etc.
  • Welcome kiosk
  • Tablet
• Patient entered outcomes data
Clinic Wait Time and Patient Satisfaction

Brendan M. Patterson

North Carolina Orthopaedic Association

October 2015
Disclosures

• None
Background

- Value based purchasing $\rightarrow$ quality of care

- Patient satisfaction $\rightarrow$ measure of quality of care

- Increased patient satisfaction has been linked to
  - Increased referral rates
  - Decreased mal-practice suits
  - Increased compliance with treatment plans

Shirley et al. JBJS. 2013
Patient satisfaction $\rightarrow$ Reimbursement

Centers for Medicare and Medicaid Services (CMS)
- Require reporting of patient satisfaction scores
- 1-2% of reimbursement withheld if not reported

Satisfaction Scores $\rightarrow$ Reimbursement

www.cms.gov
Satisfaction Score

- Consumer Assessment of Healthcare Providers and Systems
  - “CAHPS” Survey
  - Federally developed and validated patient satisfaction survey
  - 37 items, 15 pertain to the patients most recent visit.

- Measures of patient experience of care:
  - Wait-time
  - Providers communication
  - Qualities of ancillary staff
  - Rating of the Provider
**CAHPS**

Using any number from 0 to 10, where 0 is the worst provider possible and 10 is the best provider possible, what number would you use to rate this provider?

- [ ] 0  Worst provider possible
- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [ ] 6
- [ ] 7
- [ ] 8
- [ ] 9
- [ ] 10  Best provider possible

During your most recent visit, did this provider explain things in a way that was easy to understand?

1. [ ] Yes, definitely
2. [ ] Yes, somewhat
3. [ ] No
CAHPS

Using any number from 0 to 10, where 0 is the worst provider possible and 10 is the best provider possible, what number would you use to rate this provider?

- 0  Worst provider possible
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10  Best provider possible

During your most recent visit, did this provider explain things in a way that was easy to understand?

- 1  Yes, definitely
- 2  Yes, somewhat
- 3  No
Functional Outcome

- Patient Reported Outcomes Measurement Information System
  » “PROMIS”

- Patient reported questionnaire to assess physical function, pain and depression

- Valid, reliable, and comparable results

- Patient score compared to
  » General population based on age and gender

Hung et al. JOR. 2011
**Functional Outcome**

- PROMIS computerized adaptive tests (CATs)

<table>
<thead>
<tr>
<th>Item</th>
<th>Question</th>
<th>Without any difficulty</th>
<th>With a little difficulty</th>
<th>With some difficulty</th>
<th>With much difficulty</th>
<th>Unable to do</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPA11</td>
<td>Are you able to do chores such as vacuuming or yard work?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>PPA21</td>
<td>Are you able to go up and down stairs at a normal pace?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>PPA23</td>
<td>Are you able to go for a walk of at least 15 minutes?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>PPA23</td>
<td>Are you able to run errands and shop?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>PPC12</td>
<td>Does your health now limit you in doing two hours of physical labor?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>PPA11</td>
<td>Does your health now limit you in doing moderate work around the house?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>PPA5</td>
<td>Does your health now limit you in lifting or carrying groceries?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>PPA4</td>
<td>Does your health now limit you in doing heavy work around the house?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

Hays et al. APMR. 2013
Clinic wait time and patient satisfaction

- 104 patients
- Outpatient ophthalmology clinic

McMullen et al. Clinical Ophthalmology. 2013

![Graph showing the relationship between average time spent waiting (minutes) and overall satisfaction. The graph indicates a statistically significant relationship with P<0.001.]
Clinic wait time and patient satisfaction

• Prospective study of 81 orthopaedic patients.

• Decreased clinic wait time $\rightarrow$ Increased patient satisfaction

• Time spent with provider $\neq$ Increased patient satisfaction

Teunis et al. CORR. 2013
Purpose

Lower extremity orthopaedic patients

- Patient satisfaction
  - Clinic wait time
  - Time with provider

- Wait time: Actual vs Perceived

- CAHPS and PROMIS scores
Methods

• 182 consecutive patients enrolled (5 declined) from UNC foot and ankle and adult reconstruction clinics.

• Inclusion criteria:
  » New and return patients
  » ≥ 18 years of age
  » Lower extremity complaint

• Exclusion criteria:
  » Non-English speaking
  » Illiterate
  » Pediatric patients
  » Upper extremity complaint
Variables and Outcome Measures

• Wait time = check in → seen by attending surgeon

• Provider time = total time with attending surgeon

• Patient satisfaction
  » Provider rating (CAHPS)

• Function, Pain, and Depression
  » PROMIS
Power analysis:

- Teunis et al, CORR 2013:
  - Wait time = 32 minutes
  - Clinic wait time and patient satisfaction (Correlation coefficient -0.3)

UNC Sample size:

- Power = 0.80
- Alpha = 0.05
- 84 patients required to prevent reporting type 2 error
Statistical analysis

- Patients grouped by “Top Box” and “Low Box” provider rating
- Outcome variables compared between both “Top Box” and “Low Box” patient groups
- Student’s test-t and chi-squared analysis used to compare continuous and dichotomous variables respectively.
## Results

<table>
<thead>
<tr>
<th>PROMIS Survey</th>
<th>Low Box</th>
<th>Top Box</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
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<tr>
<td>Depression</td>
<td>53.38 ± 7.7</td>
<td>50.84 ± 9.5</td>
<td>0.242</td>
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<tr>
<td>Pain</td>
<td>60.71 ± 8.7</td>
<td>61.24 ± 8.1</td>
<td>0.785</td>
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<td>Physical Function</td>
<td>36.86 ± 10.2</td>
<td>37.17 ± 8.9</td>
<td>0.881</td>
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Results

Patient Satisfaction and Clinic Wait Time

Provider Rating

Clinic Wait Time (min)

P = 0.60
Results

Patient Satisfaction and Clinic Wait Time

Clinic Wait Time (min)

Provider Rating

Low Box

Top Box

P = 0.60
Results

Patient Satisfaction and Time with Provider

Provider Rating

Low Box

Top Box

Time With Provider (min)

P = 0.04
Results

Patient Satisfaction and Time with Provider

Provider Rating

Low Box

Top Box

Time With Provider (min)

P = 0.04
Results

Perceived vs Actual Wait Time

% of Patients With Perceived Wait Time <15 Minutes

Actual Wait Time (minutes)

- 0-15: 100% (P = 0.110)
- 16-30: 89% (P = 0.283)
- 31-45: 95% (P = 0.011)
- 46-60: 76% (P = 0.007)
- > 60: 46%
Conclusions

• Time-with-surgeon is associated with patient satisfaction in orthopaedic clinics, and wait time is not.

• Patients do not have an accurate gauge of actual wait time, with many patients underestimating the time they wait to see a provider.

• One strategy for improving patient satisfaction may be to spend more time with each patient, even at the expense of increased wait time.
Thank you