

JBJS Case Connector

Semantics and curation yield
an early warning system
for orthopaedic surgeons

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International Association of
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The Voice of Academic and Professional Publishing

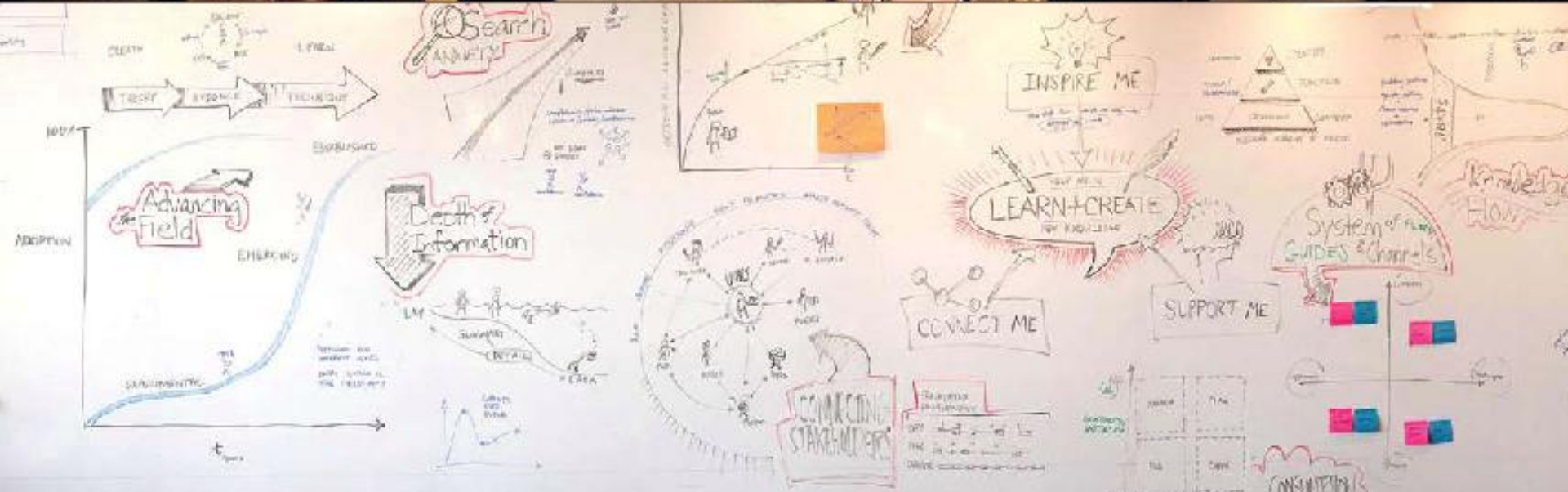
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Learning Our Audience





The Major Mode of Work

*“A journey from
theory to evidence.”*

The Problem

- Orthopaedic surgeons represent 3% of all physicians
- Orthopaedic procedures account for more than 40% of CPT codes
- Yet, like in most specialties, editors turn their noses up at case reports
- Perhaps we haven't been thinking of them properly

Old Approach to Cases

- **Old Way** – Cases were isolated reports of very strange conditions meant to illustrate a point of anatomy or physiology
- Rejection rate for cases was > 90%
- Published (and thought of) as “filler”

New Approach to Cases

- **New Way** – Cases are the start of trends, can provide insights over time, can act as “early warning system” in orthopaedics
- Rejection rate now ~65%
- Archive integrated
- More than 3,000 cases now semantically linked

Hello, Semantics

Narrow By:

Topics

- Hand & Wrist
- Hip
- Infection
- Knee
- Oncology
- Pain Management
- Pediatrics
- Rehabilitation
- Shoulder
- Spine
- Trauma

Diseases & Conditions

- adverse effects of medication
- anaphylaxis
- aneurysm, periarticular
- ankylosis of hip
- ankylosis, bony
- arthritis
- arthritis of knee
- arthritis, gouty, acute
- arthritis, juvenile rheumatoid

Anatomy

- ankle
- articular cartilage
- bone marrow
- chondrocytes
- common peroneal nerve
- condyle of femur
- distal femur
- external iliac lymph node group
- fabella
- femoral epiphysis

Treatment & Procedures

Clear All

- allografting
- amputation above-knee
- arthrocentesis
- aspiration of knee joint
- bacitracin
- bone graft, allogeneic
- bone graft, impaction
- bone transplantation
- bupivacaine
- chondrocytes

Signs & Symptoms

- abnormal cardiac conduction
- abnormal color
- anesthesia (no sensation)
- ankle pain
- ankle swelling
- antalgic gait
- bacteremia
- blister
- cardiac arrhythmia
- clicking knee

Devices

- artificial limbs
- blade plate
- bone cements
- bone nails
- bone plates
- bone screws
- bone wires
- canes
- cannulae, femoral
- condylar plate
- crutches

Patient Demographics

Gender

- female
- male

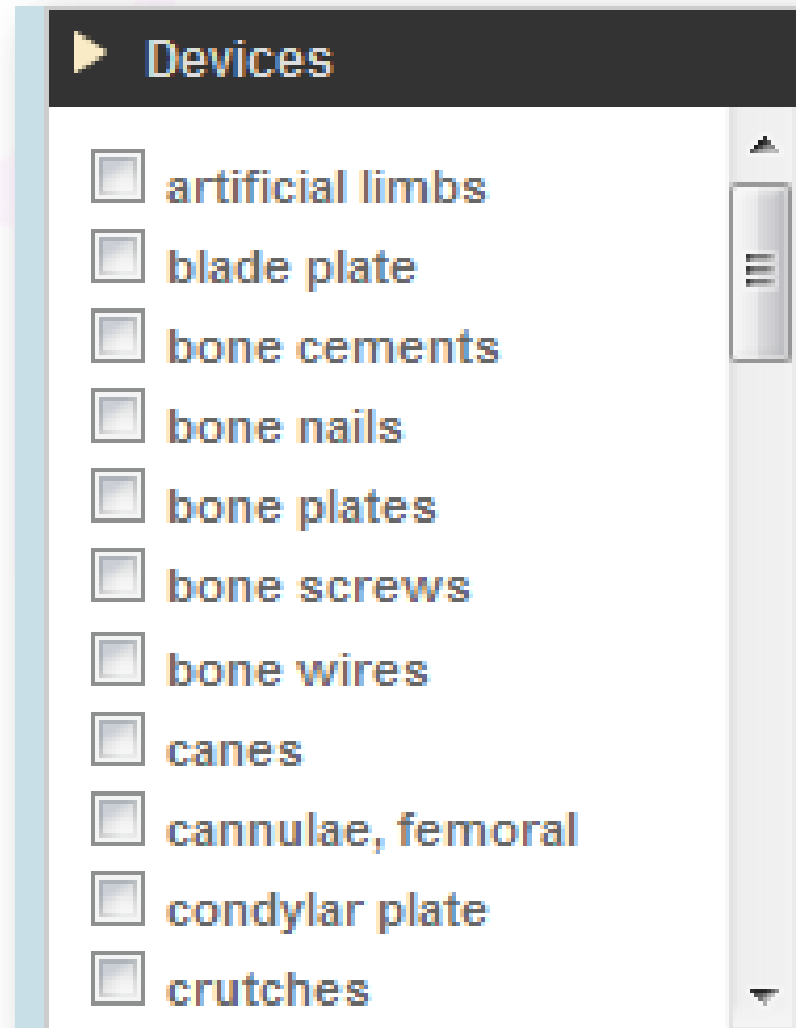
Age

- adolescent
- adult
- aged adult, 80 and over
- child
- middle-aged adult
- senior adult
- young adult

Long Lists, Strong Filters

▶ Diseases & Conditions	▶ Signs & Symptoms	▶ Patient Demographics
<ul style="list-style-type: none"><input type="checkbox"/> adverse effects of medication<input type="checkbox"/> anaphylaxis<input type="checkbox"/> aneurysm, periarticular<input type="checkbox"/> ankylosis of hip<input type="checkbox"/> ankylosis, bony<input type="checkbox"/> arthritis<input type="checkbox"/> arthritis of knee<input type="checkbox"/> arthritis, gouty, acute<input type="checkbox"/> arthritis, juvenile rheumatoid	<ul style="list-style-type: none"><input type="checkbox"/> abnormal cardiac conduction<input type="checkbox"/> abnormal color<input type="checkbox"/> anesthesia (no sensation)<input type="checkbox"/> ankle pain<input type="checkbox"/> ankle swelling<input type="checkbox"/> antalgic gait<input type="checkbox"/> bacteremia<input type="checkbox"/> blister<input type="checkbox"/> cardiac arrhythmia<input type="checkbox"/> clicking knee	<p>Gender</p> <hr/> <ul style="list-style-type: none"><input type="checkbox"/> female<input type="checkbox"/> male <p>Age</p> <hr/> <ul style="list-style-type: none"><input type="checkbox"/> adolescent<input type="checkbox"/> adult<input type="checkbox"/> aged adult, 80 and over<input type="checkbox"/> child<input type="checkbox"/> middle-aged adult<input type="checkbox"/> senior adult<input type="checkbox"/> young adult

Devices a Main Focus



- Launched in May 2011
- Delay in getting dedicated editor aboard
- New editor started in Fall 2012
- Editorial redefining cases published January 2013
- Traffic increasing
- New features launching

Traffic Growing Steadily



Case Connections

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Case Connections

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Compartments Under Pressure: One Emergency with Many Causes

Compartment syndrome is most commonly a lower-limb phenomenon, but dangerously high pressure can occur in any fascia-enclosed compartment. And cases that occur in the usual places can have unusual etiologies.

For example, the February 27 [Case Connector](#) describes a case of acute lower-leg compartment syndrome associated with an intraosseous infusion. The case sounds a cautionary note about using an injured limb for intraosseous fluid resuscitation.

A forty-nine-year-old male pedestrian who'd been struck by a car sustained polytrauma that included brain hemorrhage, pneumothorax, and fractures of the cervical spine, left tibia, and right femur. To treat shock, clinicians infused 1 L of saline solution through an intraosseous line placed in the left tibia. Within ninety minutes after line placement, the patient's left calf and foot became tense and cyanotic, and no pulse was palpable in the lower left limb. Because it was not possible to perform neurosensory assessments for suspected compartment syndrome due to the patient's condition, compartment pressures were assessed and were high in the posterior, lateral, and anterior compartments.

The patient underwent a four-compartment fasciotomy, during which the muscles of the lower leg appeared viable, but he eventually died in the hospital from brain herniation.

The authors note that it was impossible to determine whether the compartment syndrome developed as a result of the fracture, the intraosseous fluid infusion, or a combination of both. Intraosseous infusions could cause compartment syndrome if needles are misplaced or dislodged, if fluids are infused at high rates/volumes, or if fluid extravasates through a fracture site into the compartment.

The authors conclude that, whenever possible, clinicians should avoid placing an intraosseous line in a limb that is or appears to be injured, and they remind us that the humerus is another feasible site for intraosseous line placement.

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Case Connections

they remind us that the humerus is another feasible site for intravenous line placement.

Palpable Pulses Can Confuse

Compartment syndrome of the thigh is rare, but when it occurs it is often associated with a femoral fracture. Lan et al. describe the case of a [twenty-four-year-old man who sustained a femoral diaphyseal fracture](#) in a motor-vehicle accident. He had massive swelling over the fracture site, but the leg and foot pulses in the injured limb remained strong. CT angiography revealed an intact femoral artery.

In this case, the femoral vein had ruptured, resulting in high compartment pressures. After performing a fasciotomy, the surgeons stabilized the femoral fracture with an intramedullary nail. They then located the vein rupture and repaired it with a saphenous vein graft. Twelve months after the incident, the patient was fully ambulatory, the venous graft was patent, and radiographs confirmed femoral union.

The authors conclude that "femoral vein rupture should be considered when dealing with compartment syndrome of the thigh in the setting of an acute femoral fracture," especially when pulses are palpable.

Not All Pain Is the Same

Anyone would have severe "pain in the butt" after falling 32 feet and landing on his or her derriere. But in a [case reported by David et al.](#), a thirty-six-year-old man who did just that was diagnosed as having simple contusions and discharged from the ER. Two days later, he presented with severe and unrelenting pain and tense swelling of both buttocks and the proximal parts of both thighs, and he revealed that he had been passing red-colored urine for twenty-four hours. Blood work revealed rhabdomyolysis and impending renal failure, and an MRI showed extensive edema of the gluteus medius and maximus.

Surgical decompression of the gluteal compartments revealed extensive bilateral necrosis of the gluteus medius and maximus. Postoperatively, the patient received dialysis and underwent repeated gluteal debridements. All wounds eventually healed and the renal failure resolved, but the patient ended up with a Trendelenburg gait.

As the authors conclude: "Differentiation between pain resulting from trauma and pain resulting from compartment syndrome is always difficult."

Trauma Not Necessary

[Compartment syndrome can also occur in the paraspinal muscles](#), without direct trauma, as Khan et al. report. And these three additional JBJS Case Connector cases address similar out-of-the-ordinary presentations of compartment syndrome:

[Acute Bilateral Exertional Lateral Leg Compartment Syndrome with Delayed Presentation: A Case Report](#)

[Traumatic Compartment Syndrome: A Manifestation of Toxic Shock and](#)

[Infectious Pyomyositis in a Child: A Case Report](#)

[Bilateral Exercise-Induced Compartment Syndrome of the Thigh and Leg](#)

[Associated with Massive Heterotopic Ossification: A Case Report](#)

Marc Swiontkowski, MD

Editor

JBJS Case Connector

Moving to Early Warning

- Connections could provide an early warning to clinicians and researchers
- Recalls occur because a number of cases are connected
- Studies start with initial observations and resulting hypotheses
- Semantics make it possible to contemplate this approach

Concerns and Questions

- False-positive
- False-negative
- Self-fulfilling prophecy

Prototype

- Predicated on the “weather” analogy
- “Watch” is “possible”
- “Warning” is “likely”
- Judgment call for now
- Prototype helped us understand verbiage, boundaries, presentation issues

Other Ideas

- Video cases
- Cases data extraction
- Map of case sources
- Webinar on how to write a case study

Next Steps

- Watch for more patterns
- Curate more cases
- Integrate more cases via semantics
- Build the “Case Connector” brand
- Help redefine the case
 - From editorial shame to editorial tool

Time's Up!



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