

Complex Spine Checklists

How I use them in my Practice

John T. Smith, MD
Mary Scowcroft Peery Presidential Endowed Chair of Orthopedics
Chief, scoliosis service, Primary Children's Hospital
Professor
University of Utah
Salt Lake City, UT

Disclosures

- Consultant: DepuySynthes Spine: Globus; Nuvasive; Spineguard; Zimmer Biomet, Wishbone; GS Medical
- Royalties: VEPTR 2
- Board of Directors: Children's Spine Foundation; Scoliosis Research Society
- ***I have no financial relationships with 3Greens.com***

Checklists started with the Aviation Industry

- October, 1935
- Boeing Model 299 “Flying Fortress” (B-17)
- First flight: climbed to 300 feet and crashed
- Experienced pilot; Crash due to pilot error
- Pilot failed to release locking mechanism on elevator and rudder controls b/f takeoff
- Deemed “too much airplane for one man to fly”

Model 299



Solution

- Pilots created a simple checklist
- Simple, brief, and to the point
- Addressed each phase of flight
- Checklist resulted in 1.8 million miles w/o an accident

Challenges of the complex environment in which we work

- Fallibility of human memory and attention
- Lulling oneself into skipping steps even when we remember them
- “This has never been a problem before” ...until it is (ie) landing gear up!

Surgical Checklists 2019

- We all use them
- Some more than others
- Significant consequences when we skip safety steps

Intermountain Healthcare SURGICAL SAFETY PLAN

SIGN-IN	TIME-OUT	DEBRIEF
TEAM DISCUSSION Before Entering the Room <ul style="list-style-type: none">• Pertinent Medical History• Surgical/Anesthetic Plan• Equipment/Implants Needed• Airway Concerns• Blood loss > 500ml (Peds 7ml/kg)• Surgeon has marked patient• Consent form complete	IMMEDIATELY BEFORE PROCEDURE Surgeon leads, room quiet, focused <ul style="list-style-type: none">• Team Knows Each Other/Roles	PRIOR TO SURGEON LEAVING ROOM Surgeon states ready to debrief Nurse reviews aloud with team
ANESTHESIA TIME-OUT With Patient Before Sedation <ul style="list-style-type: none"><input type="checkbox"/> Confirm Patient Name/DOB<input type="checkbox"/> Confirm Procedure on Consent<input type="checkbox"/> Confirm 'YES' (if laterality/level) With Nurse Before Induction <ul style="list-style-type: none"><input type="checkbox"/> Patient Name/DOB• Wristband• EMR	<ul style="list-style-type: none"><input type="checkbox"/> Patient Name, DOB<input type="checkbox"/> Procedure to be Performed• Surgeon Reads Consent Aloud• Nurse Verifies Consent• Anesthesia Verify EMR Posting• Everyone Verifies Site<input type="checkbox"/> Allergies<input type="checkbox"/> Antibiotics<input type="checkbox"/> Essential Imaging Displayed<input type="checkbox"/> Essential Implants Correct<input type="checkbox"/> Sharps Safety (Tech)<input type="checkbox"/> Fire Safety (Tech)• Prep/Cautery/Light Source<input type="checkbox"/> Questions/Concerns/Speak Up	<ul style="list-style-type: none"><input type="checkbox"/> Instrument, sponge, needle count<input type="checkbox"/> Name of procedure(s) performed<input type="checkbox"/> Specimen labeling, including patient's name<input type="checkbox"/> Packing removal plan<input type="checkbox"/> Wound classification<input type="checkbox"/> Instrument/equipment problems<input type="checkbox"/> Key concerns for patient recovery and management
MAY BEGIN TEAM DISCUSSION REGARDING NEXT PATIENT		

Can we take checklists to the next level and improve safety in spine surgery?

If you ever told an airline pilot that you were operating on their child without a detailed checklist, they would think you were nuts!

BEFORE STARTING ENGINE		BEFORE TAXI	
Preflight	COMPLETE	Avionics and Instruments	ON
Seat Belts	SECURE	Flaps	UP
Fuel Selector	FULLEST TANK	ATIS	124.7 (or as appropriate)
Avionics/Instruments	OFF	Ground	121.9 (or as appropriate)
Brakes	HOLD	Brakes	TEST
Circuit Breakers	CHECK IN	Fuel Selector	Switch
Canopy	ADJUST	BEFORE TAKEOFF	
Mixture	IDLE CUT-OFF	Brakes	HOLD
Propeller	High RPM	Seat Belts	SECURE
Master Switch	ON	Flight Controls	FREE AND CORRECT
PRIMING ENGINE (obj for HOT start)		Instruments	CHECK
Engine Monitor	SELECT page with Fuel Flow Display	Compass and Dymon	CONFIRM HEADING
Throttle	1/8 inch OPEN	Altimeter	SET to ATIS, confirm elevation
Fuel Pump	ON	Autopilot	OFF
Mixture	FULL RICH	Fuel Selector	SET to Fullast Tank
Fuel Flow	MONITOR for > 3.5 GPH	Trim	CENTER
Mixture	IDLE CUT-OFF	Throttle	1800 RPM
Fuel Pump	OFF	Alternator	Check output
STARTING ENGINE		Engine Instruments	Oil Temp, Pressure, etc
Strobe Light	ON	Propeller Control	Cycle
Engine Monitor	SELECT page with RPM Display	Magneto	Check Drop 125/50
Throttle	1/8 inch OPEN	Throttle	1000 RPM
Propeller Area	CLEAR	Takeoff Speeds	Vr=65 Vy=110 Vx=85
Starter	ENGAGE	Tower	Obtain Clearance
Mixture	FULL RICH after running	Canopy	Secure
Throttle	ADJUST to 1000 RPM	Mixture	Full Rich, or as needed
Oil Pressure	CHECK	Propeller	Max RPM
Mixture	LEAN one inch	Lights	Strobe, Landing ON
		Transponder	Spinwak A/T - check code
		Fuel Pump	ON
		Takeoff	Normal or as needed



Why use checklists in spine surgery

- Promotes a culture of safety
- Enables all team members to speak up
- Reduces complexity
- Fewer mistakes
- “Operations are routine; patients are not”

Checklists in my Operating Room

SPINE CHECKLIST

1. TIME OUT

2. PRE-FLIP

- 1) TABLE POSITION
- 2) 4 PINS/4 STRAPS/4 TABLE LOCKS

3. POST FLIP

- 1) EYES/BITE BLOCK/ARMS
- 2) BREASTS/HIPS/KNEES
- 3) FOLEY
- 4) ANTIBIOTICS
- 5) MR./MRS. HAPPY

4. PREP

- 1) BETADINE
- 2) CHLORAPREP

5. BEFORE INCISION

- 1) TECH CHECK INCLUDING LEVELS

6. BEFORE CLOSING

- 1) TORQUE
- 2) IRRIGATION
- 3) BURR
- 4) EPIDURAL (LABELED)
- 5) DBX
- 6) GRAFT
- 7) DRAIN

Intermountain Healthcare **SURGICAL SAFETY PLAN**

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<p>MAY BEGIN TEAM DISCUSSION REGARDING NEXT PATIENT</p>		

Electronic Checklist



- Process starts in Pre-op
- Visible confirmation for everyone in the room
- Time stamped record of compliance
- Can be included in operative record

EOS Complex Spine Checklist

- Process begins with the 1st pre-op visit
- EOS patients are medically complex
- Multiple Co-morbidities that must be addressed ***BEFORE*** surgery
- Many devices to deal with
- Advanced imaging
- Aftercare planning

Complex Pre-op EOS Checklist

The screenshot displays the 3GREENS software interface. At the top left is the 3GREENS logo with the tagline "SAFER. LEARNER. HAPPIER. TOGETHER." and a navigation bar with icons for home, search, calendar, list, user, and notifications. The user is identified as "Hi John!".

The main content area is titled "Neurologic Status" and shows the patient "JOHN TEST (DOS: 11042019)". A red warning icon is present in the top right of this section. The checklist items are as follows:

- Diagnosis** - 132426 JS +
- Intact** - 132420 JS +
- Compromised** - 132408 JS +
- Level** - 132509 JS +
- TcMep** - 132521 JS +
- SSEP** - 132522 JS +
- EMG** - 132517 JS +
- None** - 132531 JS +

At the bottom of the checklist are navigation buttons: a left arrow, a right arrow, and a refresh icon.

On the right side, there are two panels: "Trackers" and "Delays". The "Trackers" panel has a table with columns: Name (ETA), Start, End, and Duration. The "Delays" panel is currently empty. Below these is a "Timers" section with a plus icon.

EOS Imaging Checklist

The screenshot shows the 3GREENS web application interface. At the top left is the 3GREENS logo with the tagline "SAFER. LEANER. HAPPIER. TOGETHER." and a navigation bar with icons for home, mail, calendar, list, user, and notifications. The user is logged in as "Hi John!".

The main content area is titled "Imaging" and shows a checklist for "JOHN TEST (DOS: 11042019)". A red warning icon is present in the top right of this section. The checklist items are:

- XR - Up to date - 132819 JS
- XR - Bending traction views - 132821 JS
- XR Lateral /Bolster - 132826 JS
- CT Ordered - 132831 JS
- CT - 3D imaging indicated - 132836 JS
- CT - 3D modeling - 132839 JS
- MRI Ordered - 132842 JS
- MRI - Image reviewed - 132843 JS

At the bottom of the checklist are navigation buttons: a left arrow, a right arrow, and a refresh button.

On the right side, there are two panels: "Trackers" and "Delays". The "Trackers" panel has a table with columns: Name (ETA), Start, End, and Duration. The "Delays" panel is currently empty. Below these is a "Timers" section with a plus button.

Other Implants To Consider

The screenshot displays the 3GREENS patient portal interface. At the top, the 3GREENS logo is visible with the tagline "SAFER. LEANER. HAPPIER. TOGETHER." and a navigation bar with icons for home, search, calendar, list, profile, and notifications. The user is identified as "Hi John!".

The main content area is titled "Neurologic" and shows the patient "JOHN TEST (DOS: 11042019)". A list of medical implants is displayed, each with a checkbox and a "+" button:

- Seizures - 133102 JS
- Vagal Nerve Stimulator - 133103 JS
- Vagal Nerve Stim turn off? - 133105 JS
- Cochlear Implants - 133106 JS
- Bipolar cautery ONLY, No monopolar - 133107 JS
- Remove before surgery if monopolar needed - 133109 JS
- Baclofen pump - 133112 JS
- Baclofen tubing - 133114 JS

On the right side, there are sections for "Trackers" (with a "Delays" sub-tab) and "Timers". The Trackers section has a table with columns for "Name (ETA)", "Start", "End", and "Durat". The Timers section has a "+" button.

At the bottom left, there are navigation arrows (back and forward) and a refresh button (circular arrow) at the bottom right.

A systematic way to consider all comorbidities at your pre-op visit

The screenshot displays the 3GREENS clinical decision support tool interface. At the top, the logo reads "3GREENS SAFER. LEARNER. HAPPIER. TOGETHER." and the user is identified as "Hi John!". The main interface is divided into several sections:

- Cardiac Filter:** A dropdown menu labeled "Cardiac" is open, showing a list of medical categories: Neurologic Status, Imaging, Infection, Neurologic, Cardiac, GI, GU, Respiratory, Blood, Preoperative Plan, Anesthesia, and Postoperative Care. A red warning icon is visible next to the "Neurologic Status" entry.
- Checklist:** A series of horizontal bars represent checklist items. Each bar has a blue "+" button on the right. The items include:
 - Neurologic Status (2019)
 - Imaging
 - Infection
 - Neurologic
 - Cardiac
 - GI
 - GU
 - Respiratory
 - Blood
 - Preoperative Plan
 - Anesthesia
 - Postoperative Care
 - Preop cardiac consult for anesthesia clearance
 - DIC panel for Duchennes
 - CICU if Fontan, transplant, pulmonary HTN, Vent dysfunction
- Trackers and Delays:** A section on the right with tabs for "Trackers" and "Delays". Below the tabs is a table with columns: Name (ETA), Start, End, and Duration.
- Timers:** A section below the trackers with a "Timers" label and a blue "+" button.
- Navigation:** At the bottom left, there are three buttons: a grey back button, an orange forward button, and a green refresh button. A blue circular refresh icon is also present at the bottom right.

When first presented to my hospital system, I was met with.....

- Website is pretty terse
- “Proprietary software, that is stand alone”
- Replicating software into a EHR is never easy
- “If Dr. Smith is finding this useful as is, why integrate it into our EHR?”
- “If you wish to pursue this, here are the zillion administrative steps you would need to follow...etc, etc.....

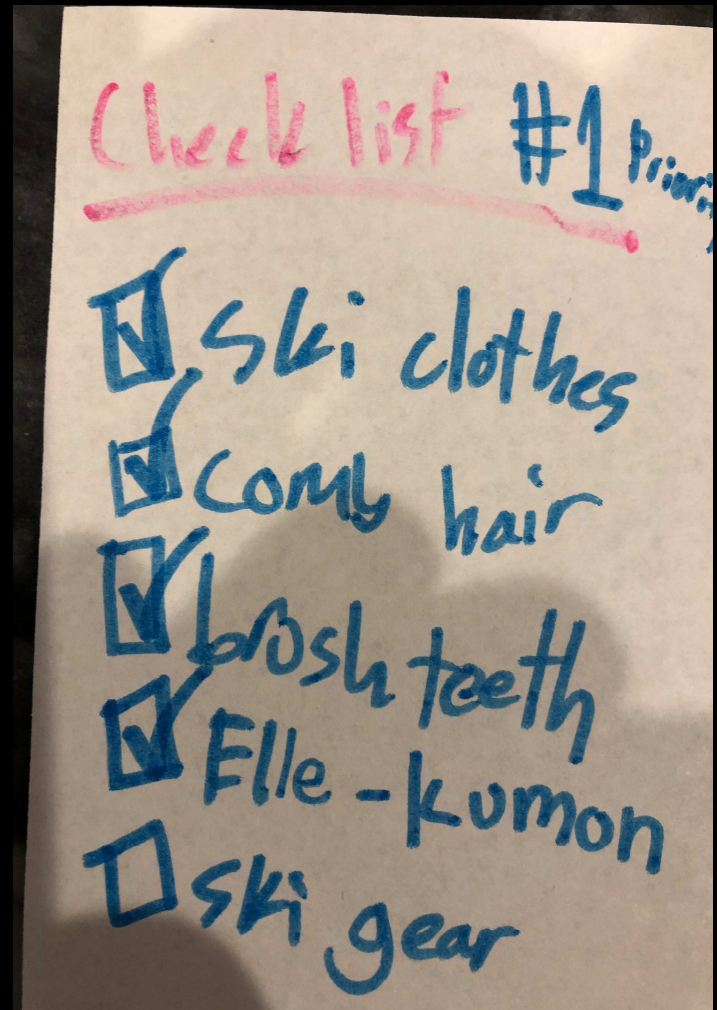
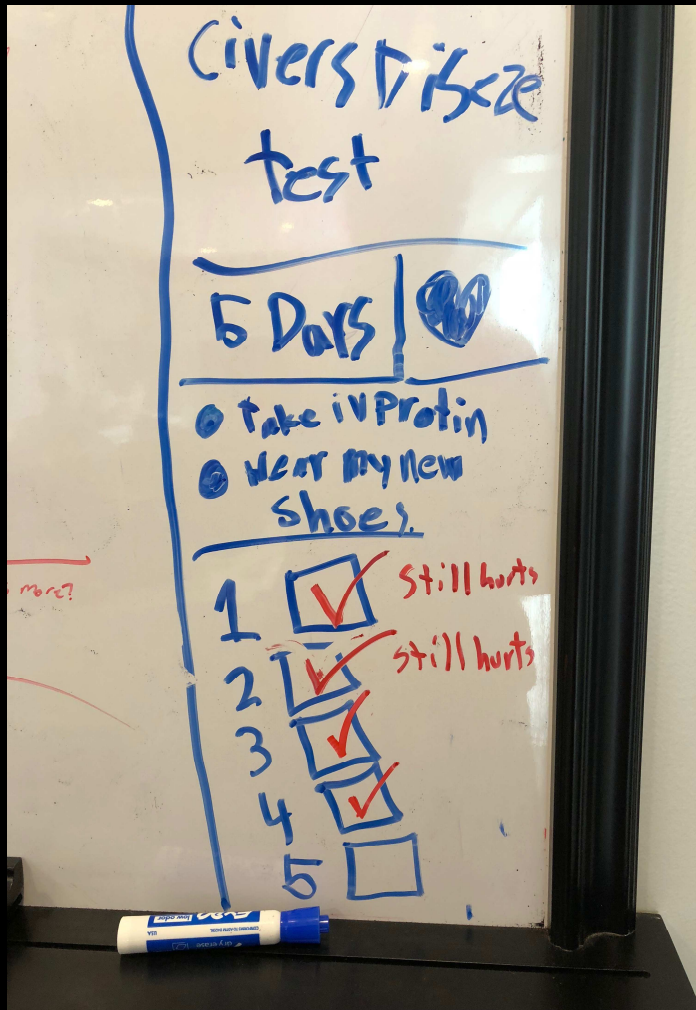
Moving forward....

“No” is always the first step in any negotiation..!

Checklists don't prevent all errors...



We even use checklists at home



Checklists help make your team be the
“A Team” and surgery safer!



Thank You

