Complex Spine Checklists
How I use them in my Practice

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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 “FlyingFortress” (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

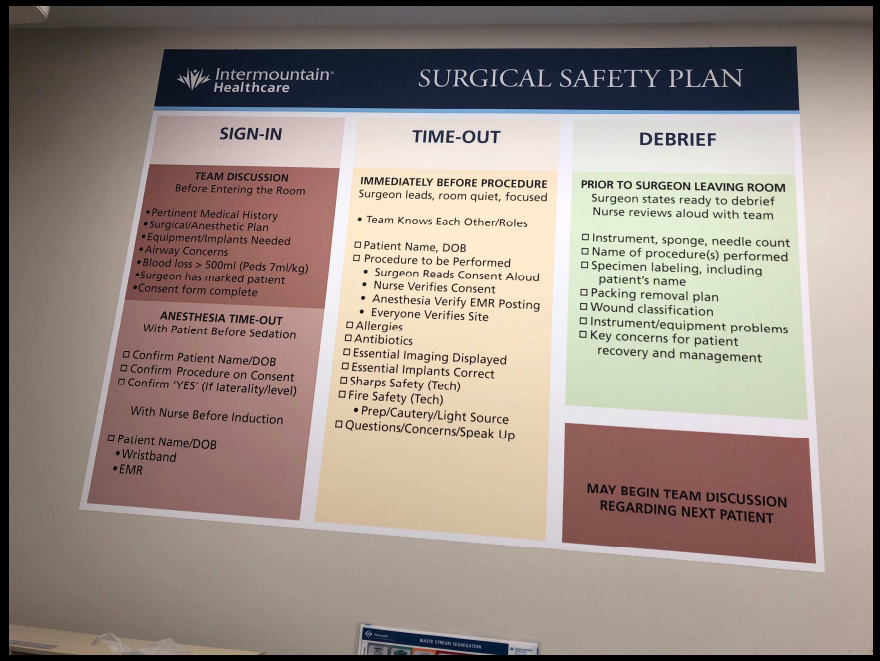
Challenges of the complex environment in which we work

- 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!

Atul Gawande. The Checklist Manifesto

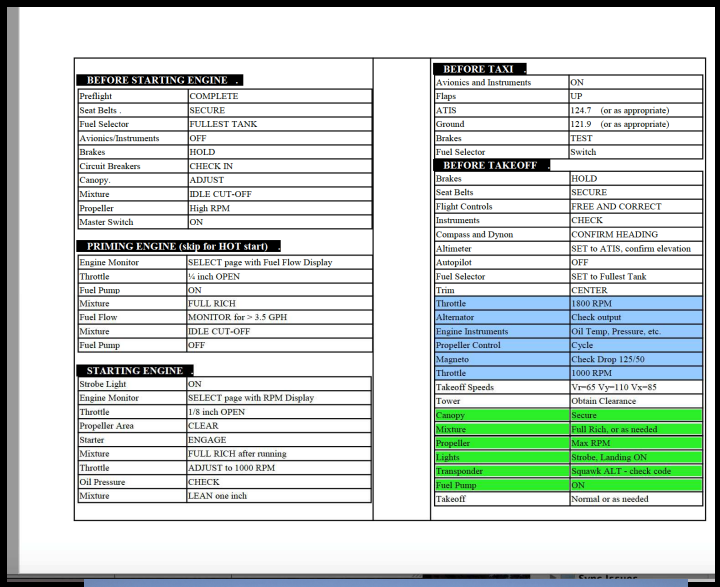
Surgical Checklists 2019

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



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	
Preflight	COMPLETE
Seat Belts	SECURE
Fuel Selector	FULLEST TANK
Avionics/Instruments	OFF
Brakes	HOLD
Circuit Breakers	CHECK IN
Canopy.	ADJUST
Mixture	IDLE CUT-OFF
Propeller	High RPM
Master Switch	ON

PRIMING ENGINE (skip for HOT start)	
Engine Monitor	SELECT page with Fuel Flow Display
Throttle	¼ inch OPEN
Fuel Pump	ON
Mixture	FULL RICH
Fuel Flow	MONITOR for > 3.5 GPH
Mixture	IDLE CUT-OFF
Fuel Pump	OFF

STARTING ENGINE	
Strobe Light	ON
Engine Monitor	SELECT page with RPM Display
Throttle	1/8 inch OPEN
Propeller Area	CLEAR
Starter	ENGAGE
Mixture	FULL RICH after running
Throttle	ADJUST to 1000 RPM
Oil Pressure	CHECK
Mixture	LEAN one inch

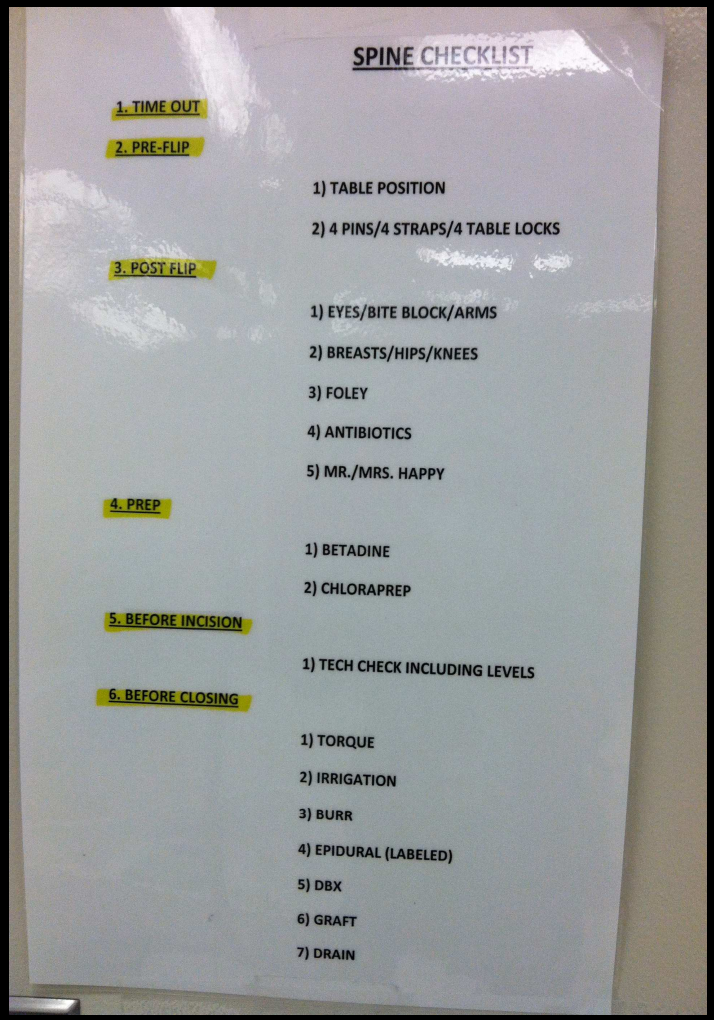
BEFORE TAXI	
Avionics and Instruments	ON
Flaps	UP
ATIS	124.7 (or as appropriate)
Ground	121.9 (or as appropriate)
Brakes	TEST
Fuel Selector	Switch

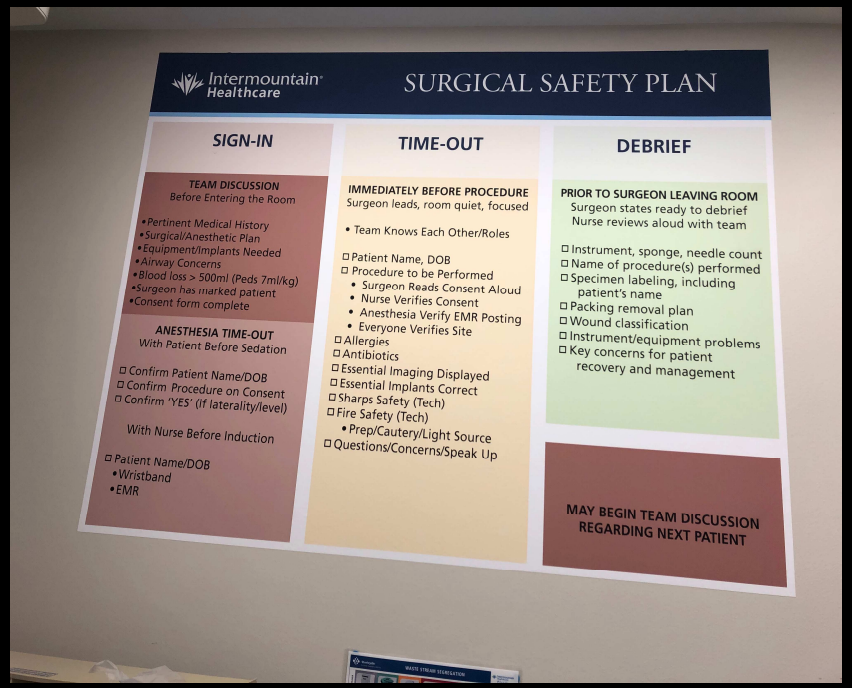
BEFORE TAKEOFF	
Brakes	HOLD
Seat Belts	SECURE
Flight Controls	FREE AND CORRECT
Instruments	CHECK
Compass and Dynon	CONFIRM HEADING
Altimeter	SET to ATIS, confirm elevation
Autopilot	OFF
Fuel Selector	SET to Fullest Tank
Trim	CENTER
Throttle	1800 RPM
Alternator	Check output
Engine Instruments	Oil Temp, Pressure, etc.
Propeller Control	Cycle
Magneto	Check Drop 125/50
Throttle	1000 RPM
Takeoff Speeds	Vr=65 Vy=110 Vx=85
Tower	Obtain Clearance
Canopy	Secure
Mixture	Full Rich, or as needed
Propeller	Max RPM
Lights	Strobe, Landing ON
Transponder	Squawk ALT - 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





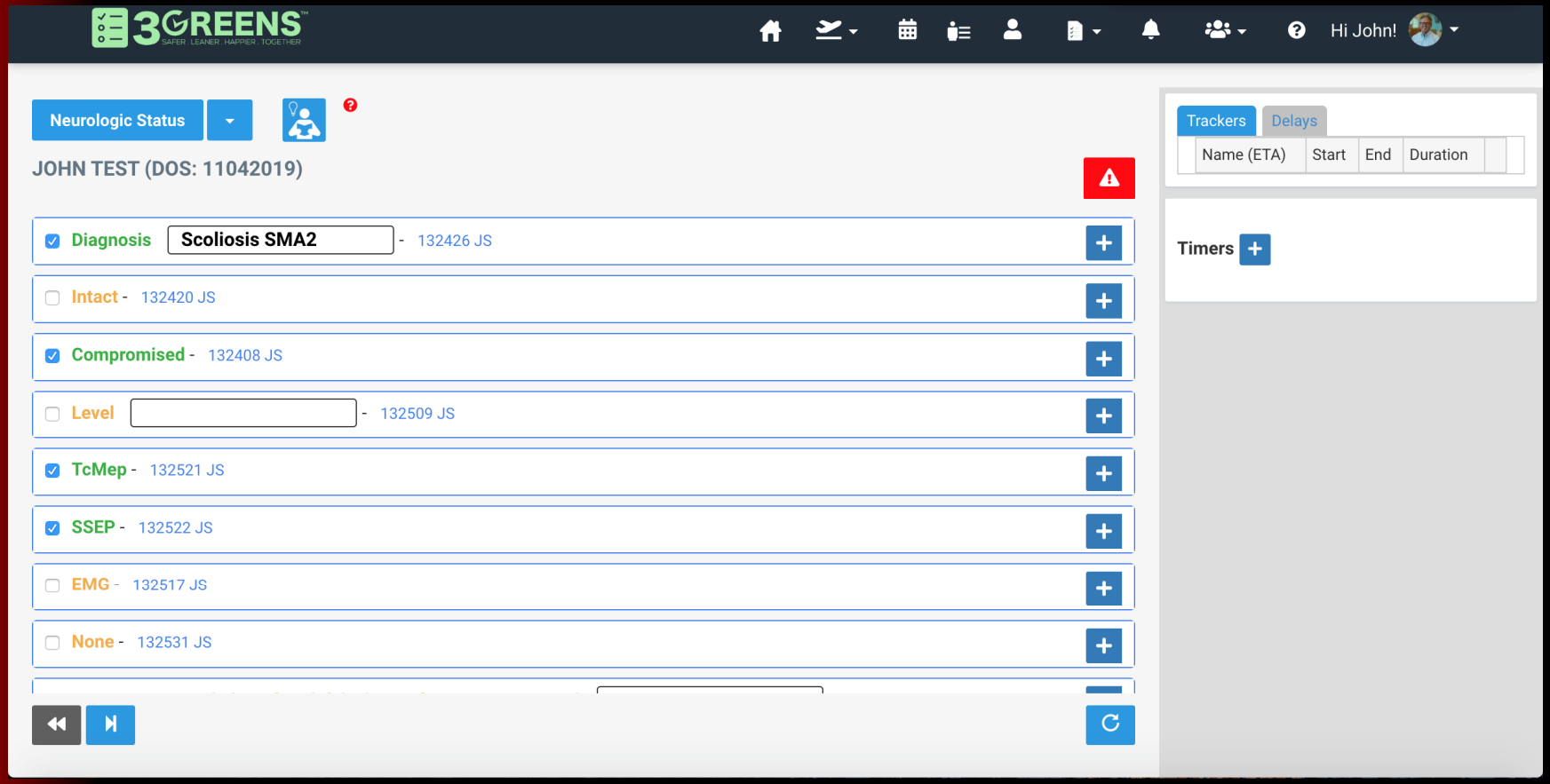
Electronic Checklist

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

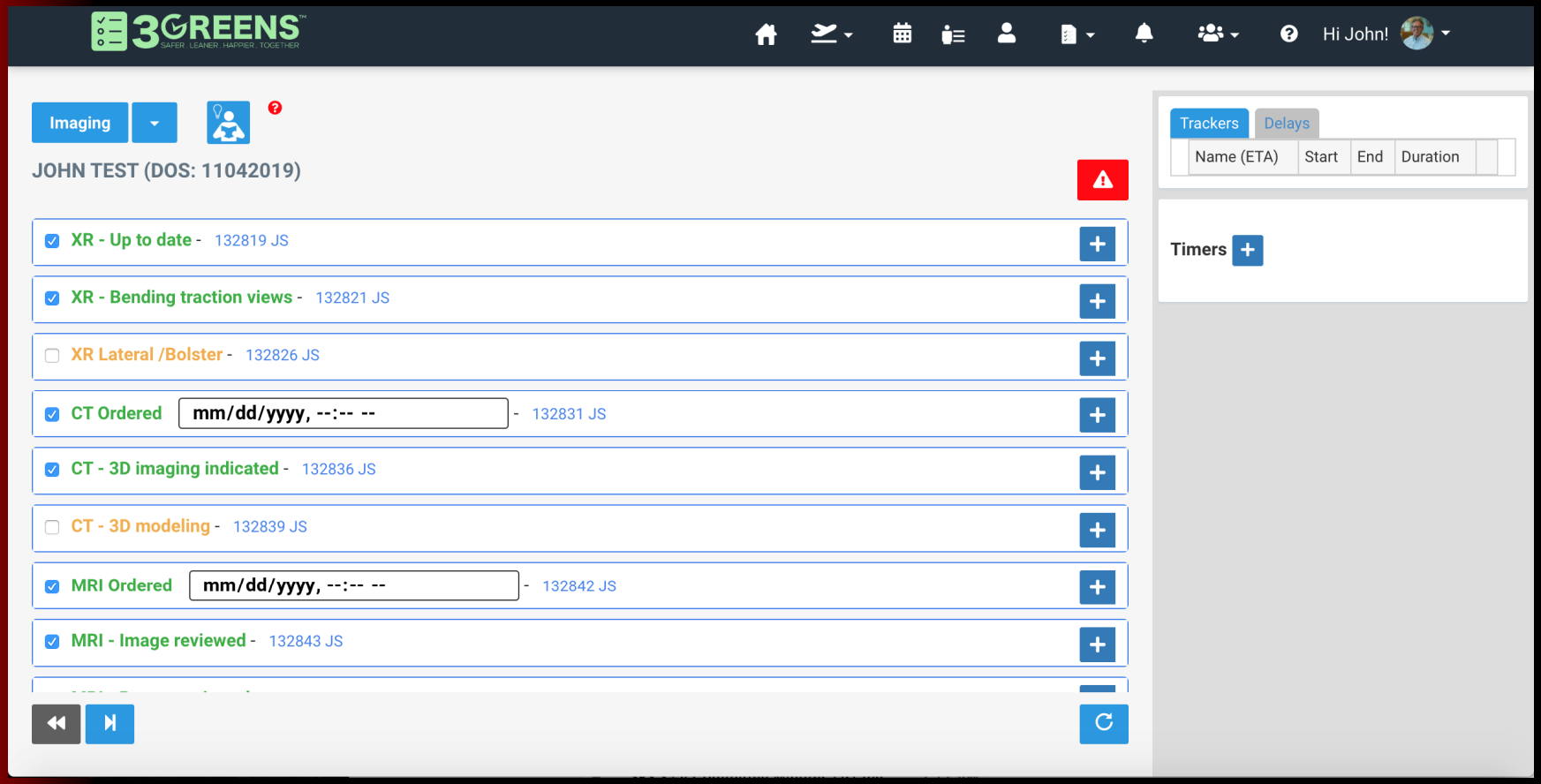
EOS Complex Spine Checklist

- 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

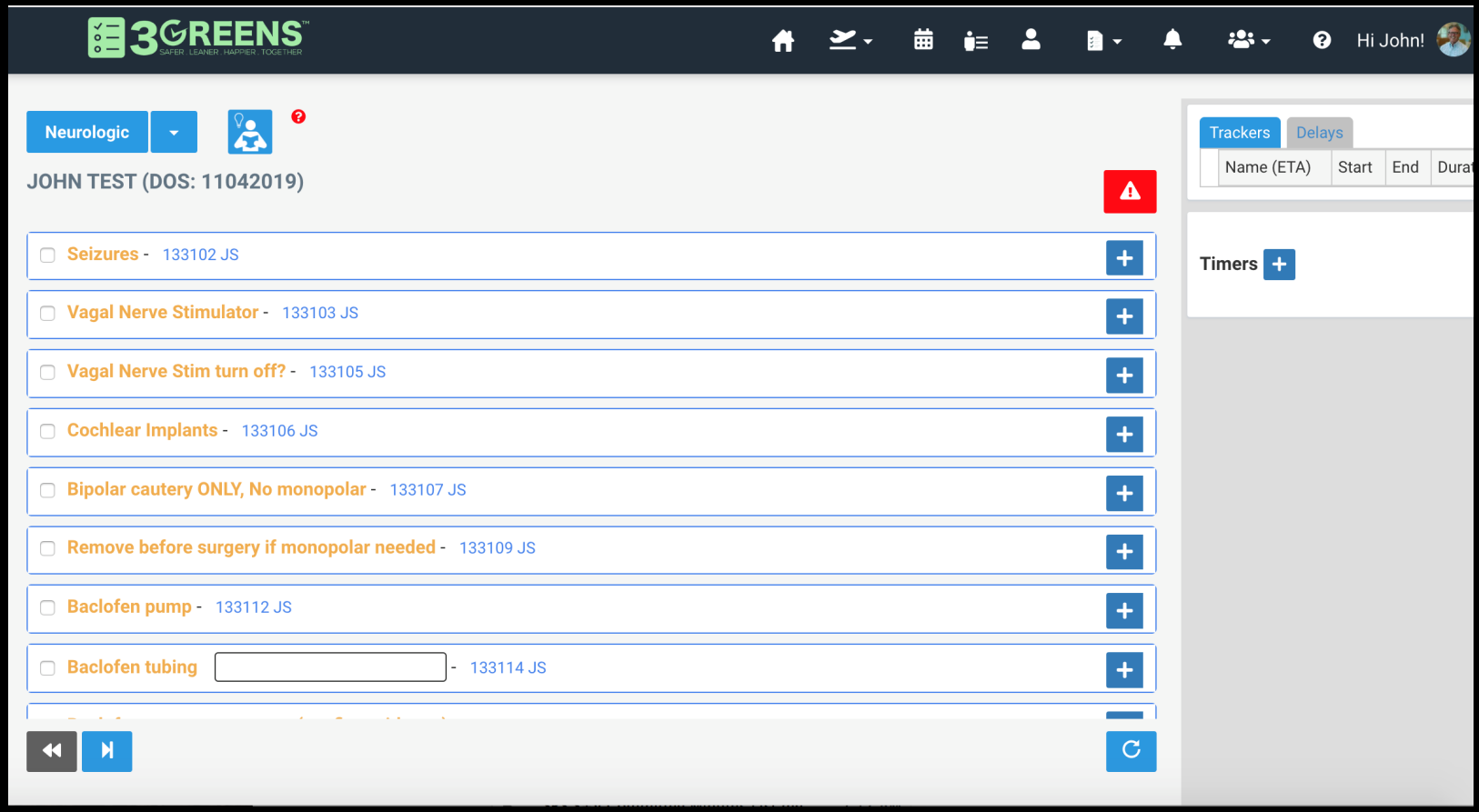
Complex Pre-op EOS Checklist



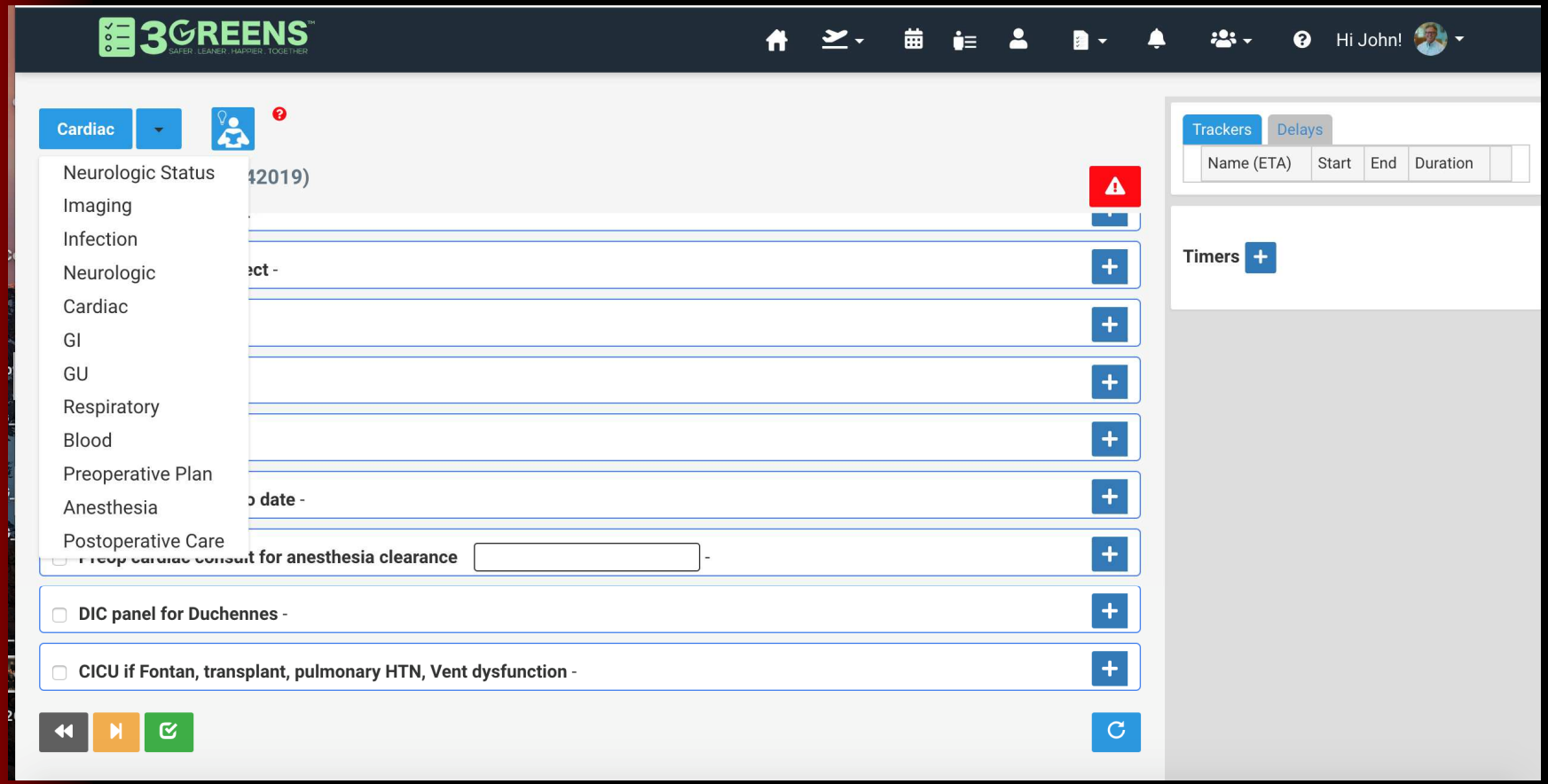
EOS Imaging Checklist



Other Implants To Consider



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



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

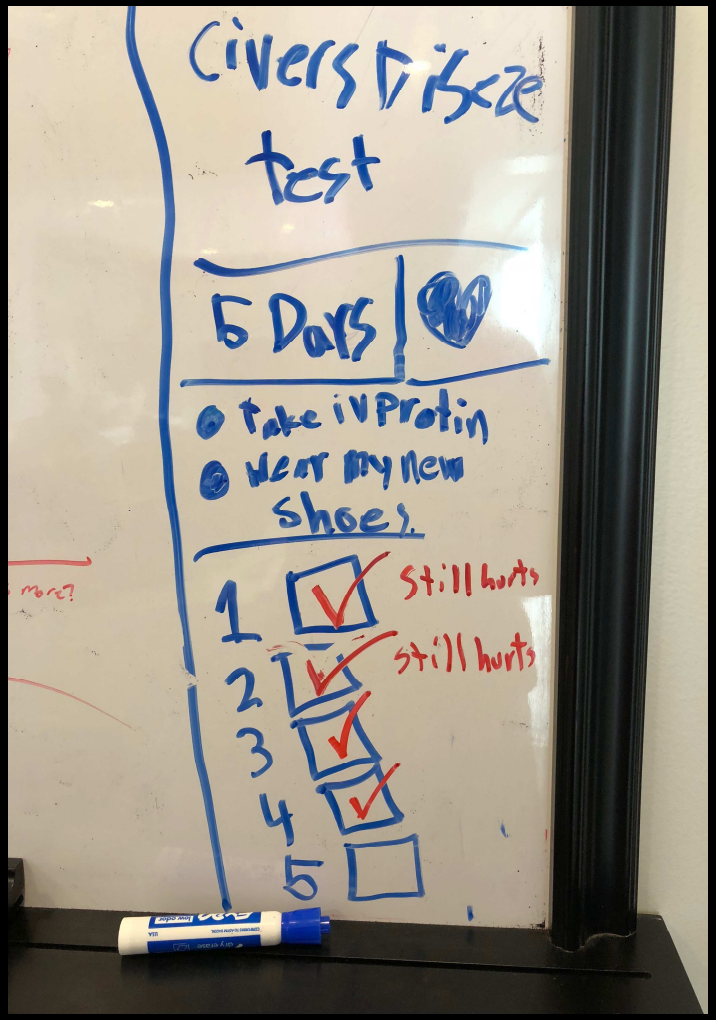
- Website is pretty terse
- “Proprietary software, that is stand alone”
- Replicating software into a EHR is never easy
- “If Dr. Smith is finding this useful as is, why integrate it into our EHR?”
- “If you wish to pursue this, here are the zillion administrative steps you would need to follow…etc,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

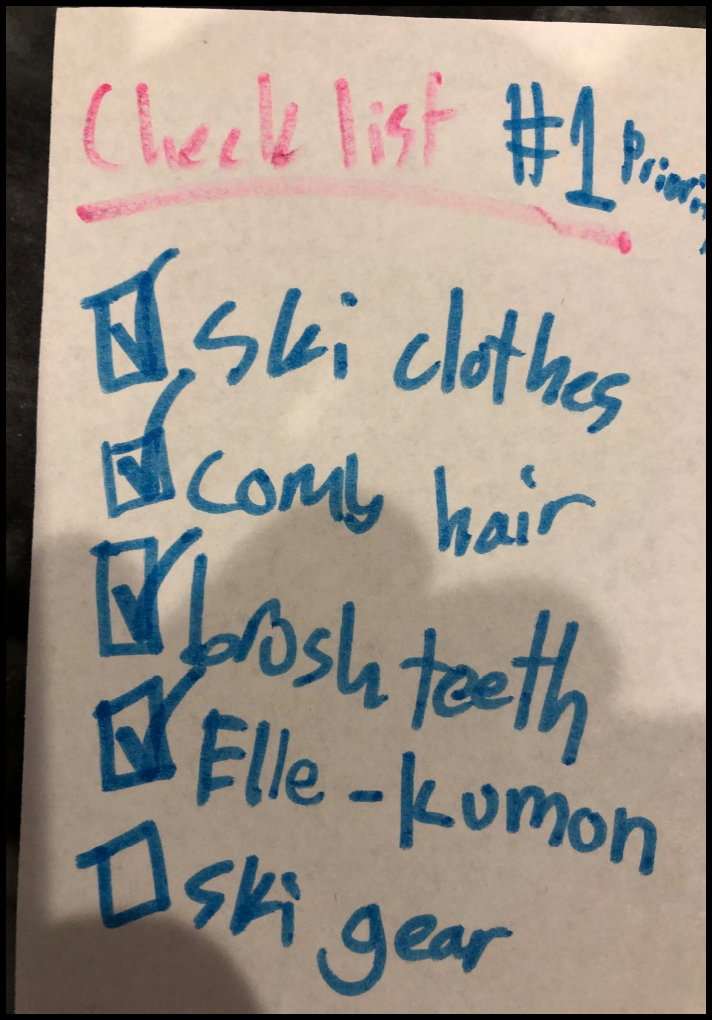
Moving forward….

“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