Jonathan Fryer MD, MS, MHPE.
Richard H Young Professor of Surgery.
Vice Chair of Surgery for Education
Feinberg School of Medicine, Northwestern University.
Disclosures

- American Board of Surgery
- Association for Surgical Education
- Association for Program Directors in Surgery
  - Massachusetts General Hospital
  - Department of General Surgery
  - Department of Orthopedic Surgery
  - Department of Oral and Maxillofacial Surgery
    - Department of OB/Gyn
  - Northwestern University
  - Department of General Surgery
    - Indiana University
    - Department of General Surgery
  - The institutional members of PLSC
Goals

1) Workplace assessment
2) Progressive autonomy
3) The Zwisch scale
4) The SIMPL app
5) Feedback
What do you *really* want to know about your surgeon?
Primary goal: To develop physicians who can provide competent medical care independently.
Competence

The ability of an individual to do a job properly.
(i.e. Safely and effectively)
Autonomy

• A state achieved by trainees when their supervisors deem they are competent and can be entrusted to independently provide medical care safely and effectively.

Miserandion 1996, Wulf 2010
Ryan & Deci 2000
Stritter FT 1986.
Vollmer 2011, Kasotakis 2014, George 2014
Entrustable Professional Activities (EPAs)

• Essential professional responsibilities or tasks that trainees must demonstrate competence with before they can be entrusted to perform them independently (i.e. with autonomy).

Professor Olle Ten Cate
Core EPAs for General surgery

- Performance of core surgical procedures.
- Assessment and management of patients with possible surgical problems.
- Post-op management of surgical patients.
- Communication with families/friends of surgical patients.
- Etc., Etc.
With an EPA...

• Demonstration of competence... builds trust and endorses progressive autonomy.
It takes two...

Teacher
- Providing Opportunity + Feedback
- Progressive Autonomy

Learner
- Building Trust
Supervised Progressive Autonomy
• How can we better ensure our trainees are competent before we release them into independent clinical practice?
• What better way to confirm trainee competence with a core EPA than to have multiple faculty supervisors document that they have witnessed the trainee safely and effectively perform it independently?
Essential Components of Supervised Progressive Autonomy

Performance Assessment

What level are you at?

Feedback

How can you get to the next level?
"If you can't measure it, you can't improve it."
Assessment strategies

Written Exams

Workplace assessment

OSCEs, etc.
Your evaluation is based on the next 30 seconds. Go!
Surgical Workplace Environment

- Uncontrolled!!
- Unpredictable!!
- Busy!!

- But real.
• How can we effectively assess performance competence in the workplace?

“I don’t have time to write performance reviews, so I’ll just criticize you in public from time to time.”
• How do we do it now?
  – How can we do it better?
OR performance assessment

How we do it now?

• Retrospectively!

We need Real-Time assessments!

Williams et al.
OR performance assessment

How we do it now?

• Periodic performance assessment “snap shots”!

– We need multiple frequent assessments from multiple assessors!
OR performance assessment

How we do it now......

- Irrelevant and/or cumbersome assessment tools!

- Tools need to be relevant to the primary goal of training!
Workplace performance assessment tools

- Must not be cumbersome........ or they won’t be completed....... or will be completed improperly!
Workplace performance assessment

• Assessor compliance?

• We need to simplify things for those doing the assessments.
Workplace performance assessment

• Clinical Competency Committees

• Milestones!!!
What is the single most important parameter we can use for ongoing assessment and monitoring of trainee progression towards competence with core EPAs?
Supervised Progressive Autonomy
Guidance (Help)

• Physical direction or verbal advice provided to resolve a problem or difficulty.

Supervision

• The act or function of overseeing someone and making sure everything is done properly.

1Ulmer 2008, 2Nasca 2010, 3Chen 2010
Supervision always required

Supervision
With guidance

Supervision Only
i.e. Without guidance
“Supervised” Autonomy
The “Zwisch” Scale
for supervised progressive autonomy

• 4 levels of “guidance”
  1) Show & Tell
  2) Active Help
  3) Passive Help
  4) Supervision Only

George et al. JSE 2013
George et al. JSE 2014
Bohnen, J. et al. JSE 2016
Show and Tell

OK, I’ll show you how I do a hernia repair, and tell you what I’m doing and why.

Ok, I’ll watch and learn how he does it... so that maybe I’ll be ready to do part of it next time.
Active Help

Take a bigger bite! No...don’t grab that. Suck!!! Suck!!! Here let me show you.
Passive Help

Losing some blood.... I’ll have to step in if he doesn’t get control soon.

I’m having a little trouble getting that bleeder exposed.... Gonna need your help... can you help retract the bowel here for me?
I think he’s ready to do this on his own.

Looks good...I’m gonna scrub out and let you do this with the intern. I’ll be watching your progress and will scrub back in if you need me.

Supervision Only

Thanks. I’ll do the case with the intern and help him close. We should be OK.. but I’ll call if there are any concerns.
Trainee completes a self-assessment of their performance using SIMPL app.

Attending & resident entered data sent to SIMPL database.

SIMPL software aggregates data.

Attending reviews resident’s previous performance with procedure.

Trainee self-assessment triggers an alert to the attending’s smartphone.

Attending & trainee perform procedure together.

Attending completes assessment and dictates specific feedback!

Resident listens to attending feedback and calls to discuss if needed.

Attending & resident entered data sent to SIMPL database.
American Board of Surgery Study

• 14 general surgery programs.
• 16 month study period.
• All general surgery faculty and residents.
• Use SIMPL app to assess resident autonomy with every procedure performed.
SIMPL Trial Participants

1753 residents and attendings

INSTITUTION LOGOS
Autonomy (Zwisch) distribution by trainee PGY for all procedures
(9,193 ratings by 444 raters of 536 subjects)

Meaningful Autonomy: 66%
Supervision Only: 15%
Passive Help: 15%
Active Help: 6%
Show & Tell: 4%

Trainee PGY

# Ratings: 1309, 1334, 2094, 2832, 2561
Autonomy (Zwisch) distribution for General Surgery residents in final six months of training for Core procedures (599 ratings by 136 raters of 71 subjects)

- 33% Supervision Only
- 77% Autonomy (Zwisch)
Meaningful Autonomy

Correlation coefficient = 0.59

96.6% of graduating PGY5s in study performed ≥ 25 procedures.
Adjusted Performance by End of-Training for Top 5 Core Procedures

Assuming a typical trainee rated by a typical attending

- Appendectomy: 97%
- Cholecystectomy: 92.8%
- Ventral HR: 91.8%
- Ing./Fem. HR: 81.8%
- Partial Colectomy: 81.8%

Patient-Related Complexity:
- Easy
- Average
- Hard
Transition to practice: are residents ready?
Is it better to achieve acceptable autonomy before or after graduation?

- Optimizing for today
- Optimizing for the future
How do learners progress from one Zwisch Level to the next?
Effective Feedback!
Intraop Feedback

Yikes! He’s going to tear a hole in the vena cava if he keeps doing that!

OK… I think I know what you mean but I can’t see the veins very well from this side. Can you show me how to better visualize the veins?

You have to more careful mobilizing the liver or you will tear the hepatic veins. You have to retract more gently and then ligate and divide the veins cautiously. Try again or I will show you what I mean.
Post-op Dictated Feedback
'With most steps of the operation you achieved a level of *active help*. To progress to the next level, *passive help*, you will need to convince me that you know:

1) All the steps of the procedure.
2) Which steps are the most difficult.
3) What strategies you will use to minimize risk with these steps. Furthermore......."
Dictated Feedback
Printed Feedback
Advantages of Post-op dictated feedback

• Can be linked to performance assessment.
• Can be completed even if faculty has to “run off”.
• Can be completed while “on the run”.
• Can be immediately reviewed by trainees.
• Can be saved for later review (audio or printed):
  – Clinical competency committee
  – Faculty feedback and coaching
• Facilitates granting of intra-op autonomy to trainees.
Future Directions

SIMPL profile score

• Enhancing faculty feedback
  – Better quality
  – Greater frequency
• Measuring impact of faculty feedback on trainee’s progressive autonomy.
SUPERVISED PROGRESSIVE AUTONOMY?
• Facilitative Feedback
• Elaboration
• *Scaffolding*
Essential Components of Supervised Progressive Autonomy

Performance Assessment

“Your evaluation is based on the next 30 seconds. Go!”

Feedback

“I’m gonna need more specific feedback on my formative assessments.”
Dictated Feedback and SIMPL
Educational Alliance

Feedback Culture

Faculty
- Supportive environment.
- Timely feedback provided consistently.
- Feedback seeking encouraged.
- Constructive feedback explained / discussed.
- Multiple feedback sources.
- Strategy focused approach.

Resident
- Reflection in action.
- Timely feedback actively sought.
- Constructive feedback clarified and processed impersonally.
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<tr>
<th>Survey Item</th>
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Zone of Proximal Development (ZPD)
To enhance their progression to autonomy, we need to be willing to support our trainees while they struggle to achieve the next level.

This creates the optimal scenario for effective feedback.
Trainee completes a self-assessment of their performance using SIMPL app. Attending & resident entered data sent to SIMPL database. SIMPL software aggregates data. Attending reviews resident’s previous performance with procedure. Trainee self-assessment triggers an alert to the attending’s smart phone. Attending completes assessment and dictates feedback. Resident listens to attending feedback and calls to discuss. Attending & resident entered data sent to SIMPL database.
What better way to demonstrate trainee competence with an operative procedure than to have multiple supervising faculty entrust the trainee to perform the procedure independently.... and document it?
Future Directions

SIMPL profile score

- A personalized score based on cumulative autonomy/ performance levels achieved, adjusted for procedural complexity, case difficulty, faculty rater stringency, etc.
  - All procedures performed;
  - Core general surgery procedures
  - Specialty specific procedures of interest
Recipe for successful feedback

• Do not only praise.
Performance distribution by trainee PGY
(8,526 ratings by 437 raters of 522 subjects)

- 13% “% Competent”
- 69%
Correlation coefficient = 0.61
88.1% of graduating PGY5s in study performed > 55
Resident Autonomy By PGY

Zwisch distribution by PGY
(4150 ratings by 327 raters of 381 subjects)

PGY
1 - 82%
2 - 57%
3 - 64%
4 - 39%
5 - 31%

Percentage

Zwisch rating
- Supervision Only
- Passive Help
- Active Help
- Show & Tell

1047
1140
841
530
592

n
0
500
1000
Partial correlation of each variable with autonomy (Zwisch) level granted controlled for the effect of all other variables.
Autonomy achieved for laparoscopic cholecystectomy

Zwisch distribution by trainee PGY for laparoscopic cholecystectomy
(823 ratings by 187 raters of 292 subjects)

Zwisch rating
- Supervision Only
- Passive Help
- Active Help
- Show & Tell
## Procedural #s correlating with autonomy

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Procedure #’s needed for 50% of residents to achieve highest autonomy levels</th>
<th>Procedure #’s needed for 75% of residents to achieve highest autonomy levels</th>
<th>Procedure #’s needed for 90% of residents to achieve highest autonomy levels</th>
<th>Correlation coefficient</th>
<th>p</th>
</tr>
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<tbody>
<tr>
<td>Lap Choley</td>
<td>≥ 35 (n=83)</td>
<td>≥ 108 (n=21)</td>
<td>≥ 182 (n=3)</td>
<td>0.931</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Lap Appy</td>
<td>≥ 25 (n=70)</td>
<td>≥ 57 (n=20)</td>
<td>≥ 90 (n=9)</td>
<td>0.979</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Open Inguinal Hernia repair</td>
<td>≥ 79 (n=5)</td>
<td>-</td>
<td>-</td>
<td>0.925</td>
<td>&lt;0.01</td>
</tr>
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Pilot study results (2012-2013):
Resident independence by PGY

Data collected at a single institution over final 7 months of academic year.

George B. C. et al 2014
Other studies underway

- Self assessment vs. faculty assessment.
- Gender differences in progressive autonomy.
- Influence of apprenticeships on autonomy.
- Autonomy vs Performance levels assigned.
- Variability in faculty entrustment practices.
- Transferability of surgical skills between procedures.
SIMPL – Potential Value to Trainees

- Immediate feedback.
- Autonomy based learning paradigm.
- Accessible performance assessment.
  - C/W previous
  - C/W PGY cohort
    - Program
    - National
• Ø Work-flow disruption
• Autonomy based teaching paradigm.
• Pre-op access to trainee prior entrustment levels.
• Autonomy granting profile.
  – C/W peers
SIMPL – Potential Value to PD

• Individual Trainee Eval:
  – Deviation from norm
    • C/W previous
    • C/W PGY cohort
  – Program
  – National

• Faculty Eval:
  – Autonomy granting
  – Feedback

• Program Eval
  – C/W other programs
  – C/W national norms
• Provide a method to assess overall operative performance:
  – Certification threshold requirement.
  – Fellowship application.
  – Job application.
• Establish National/International norms and standards for surgical training.
• Improve clinical outcomes, patient safety.
Autonomy

• The ability to *independently* provide care safely and effectively.
We need to focus and simplify
Residents have to build trust...
Feedback Types

Directive
(Verification)
*Indicating if you are right or wrong*

Facilitative
(Elaboration)
*Explaining why you are right or wrong*
Facilitative Feedback

- Guidance
- Support
- Scaffolding

What is a “scaffold”?

Think about how this term is used in the building industry...

- A “scaffold” is a temporary platform.
- “Scaffolding” means to “provide support”.
- Scaffolds get people to a higher level that they cannot reach without support.
Recipe for successful feedback

• Focus on the task..... not the individual.
Recipe for successful feedback

- Link to personal goals (Residents-Autonomy) (Med students-shelf exam?, residency?).
  - Here’s where you are.
  - Here’s where you need to be.
  - Here’s how to get there.
Recipe for successful feedback

- Do not undermine self-esteem.

“Feedback, when given well, should not alienate the receiver of the feedback, but should motivate them to perform better.”

- M.O., Manager, Fortune 500 Company
Recipe for successful feedback

• Immediate/timely
  – Face to face
  – Recorded (SIMPL)

<36 hours
Practical Feedback Models

- Feedback sandwich
Practical Feedback Models

Pendleton’s rules

- Check learner is ready for feedback
- Let learner give comments/background on the material being assessed
- The learner states what was done well
- Observer(s) state what was done well
- Learner states what could be improved
- Observer(s) states **how** it could be improved
- An action plan for improvement is made
• Preop Briefing
  – With Feedback

• Intraop Teaching
  – With Feedback

• Postop Debriefing
  – With Feedback
Postop Debriefing

- 2-way discussion.
- What did they do well?
- What do they need to work on?
- What are the goals for the next time they do this procedure?

Feedback!
Post-operative Feedback

Verbal

“Face to Face”

Dictated into smart phone (SIMPL)
Self-motives for seeking feedback

• Self-assessment
  – How good am I?

• Self-improvement
  – How can I get better?

• Self-enhancement
  – I’m good. Who else will acknowledge this?

• Self-verification
  – I think I’m good. Do others think so too?
Feedback Reactions

Feedback Processing
• Self-assessors and Self-improvers
  – Deep processing of all feedback
• Self-enhancers
  – Process feedback on success > feedback on failure
  – Spend more time reviewing favorable feedback than unfavorable.

Feedback Acceptance
• Self-enhancers, Self-verifiers
  – More likely to dismiss self-refuting feedback
Factors limiting Feedback Acceptance

• No new information
• Source credibility
• Inconsistency
• Lack of relevance
  – Not oriented to personal goals
• Negative feedback
Educational Alliance

Feedback Culture

Faculty

• Supportive environment.
• Timely feedback provided consistently.
• Feedback seeking encouraged.
• Constructive feedback explained / discussed.
• Multiple feedback sources.
• Strategy focused approach.

Resident

• Reflection in action.
• Timely feedback actively sought.
• Constructive feedback clarified and processed impersonally.
Why are we talking about feedback?

...because...
103rd ANNUAL MEETING
AMERICAN ACADEMY OF PERIODONTOLOGY

AUDIENCE PARTICIPATION TIME!
## ACGME Resident Survey
### 2014-2015

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What is feedback?
Why do individuals seek feedback?
Feedback is HUGE!!!
Millennials and feedback?
BAD Feedback
NO Feedback

Mediocre Feedback
Good Feedback
Great Feedback
• To enhance their progression to autonomy.... we need to be willing to support our trainees while they struggle in their ZPD.

• This creates the optimal scenario for effective feedback.
Feedback Structure

• Verbal

• Written

• Numerical
• So why do we in the medical profession suck at providing feedback?
Feedback Structure

- Verbal
- Written
- Numerical
• We are diagnosis oriented
  – We focus on identifying problems...not on providing possible solutions.
• We are hierarchal with feedback:
  – Unidirectional
  – Content driven.... not context driven
What level is the resident for the majority (i.e. > 50%) of the critical portion?
Feedback

• Helpful information or criticism given to someone to tell them what they can do to improve their performance.
Why is feedback important?

• Reinforce good performances.
• Modify sub-optimal performances.
• Reduce learner uncertainty.
• Serve as a learning catalyst.
• Keep trainees from straying from the correct path.

Wood BP. Radiology 2000
Branch WT et al. Acad Med 2002
You have completed the evaluation.
Progressive Trustonomy

Teacher Trust

Learner Autonomy

Independence

Dependence

Minimum

Maximum

Teacher Trust

Progressive Trustonomy
Supervision Only

I think he’s ready to do this on his own.

Thanks. I’ll do the case with the intern and help him close. We should be OK, but I’ll call if there are any concerns.

Looks good...I’m gonna scrub out and let you do this with the intern. I’ll be watching your progress and will scrub back in if you need me.
Active Help

Take a bigger bite! No...don’t grab that. Suck!!! Suck!!! Here let me show you.

What???
Where???
How??
Holy crap!!
Serenity now...
Serenity now...

Northwestern Medicine
SIMPL: a data collection method for Educational Quality Improvement

1. SIMPL evaluation created
2. Notification automatically sent to counterpart’s smart phone
3. Users complete assessment with as few as 4 “taps”
4. Faculty dictate specific feedback

Stats & dictations are available in real-time for residents, faculty, and programs
Future Directions

• Research
  – Effectiveness of educational interventions in enhancing entrustment and progressive autonomy.
  – Transference of surgical skills between procedures.
  – Relationship between training outcomes and clinical outcomes in graduates:
    • Fellowship training
    • First years in practice
Trainee completes a self-assessment of their performance using SIMPL app.

Attending & resident entered data sent to SIMPL database.

SIMPL software aggregates data.

Attending able to see resident performance for procedure relative to peers.

Trainee self-assessment triggers an alert to the attending’s smart phone.

Attending & Trainee perform procedure together.

Attending completes assessment, AND DICTATES SPECIFIC FEEDBACK.