"Mitigating the Dental July Effect"

UT Health School of Dentistry

Meet the Team

Participants

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   Mark Littlestar DDS Assistant Dean for Clinics

   Barbara MacNeill Assistant Director Advanced Education in General Dentistry Program

Facilitator

   Edna Cruz. M.Sc., RN, CPHQ, CPPS

Sponsor

Gary F. Guest, DDS, Associate Dean & Associate Dean for Patient Care
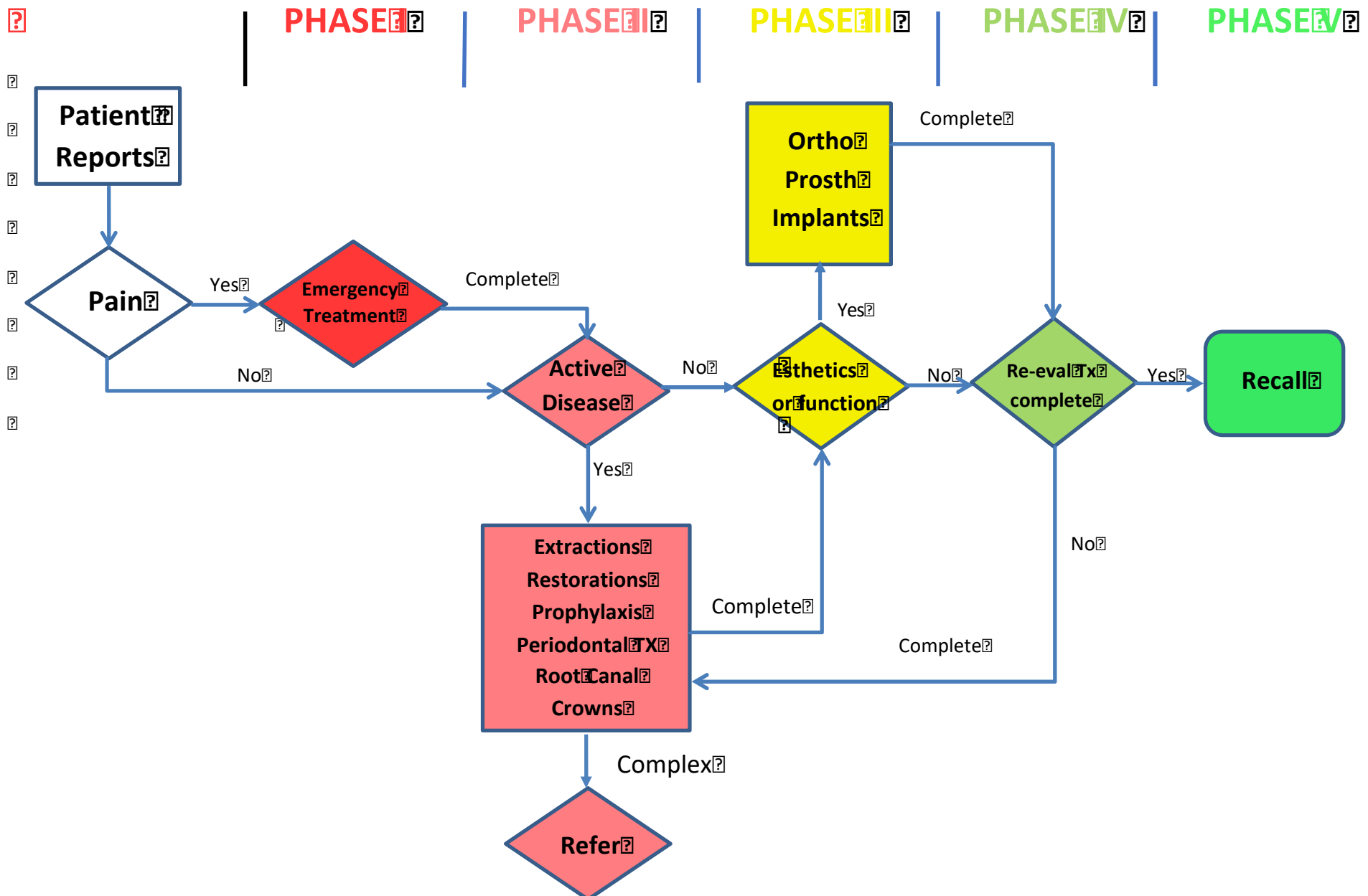
The July Effect Defined

- The term "July Effect" refers to a "perceived increase in the risk of medical errors and surgical complications that occur when... medical school graduates begin residencies.

  - https://en.wikipedia.org/wiki/July_effect

- Dental schools experience the same perceived effect in the first months of clinical experience despite concerted efforts to mitigate this phenomenon.
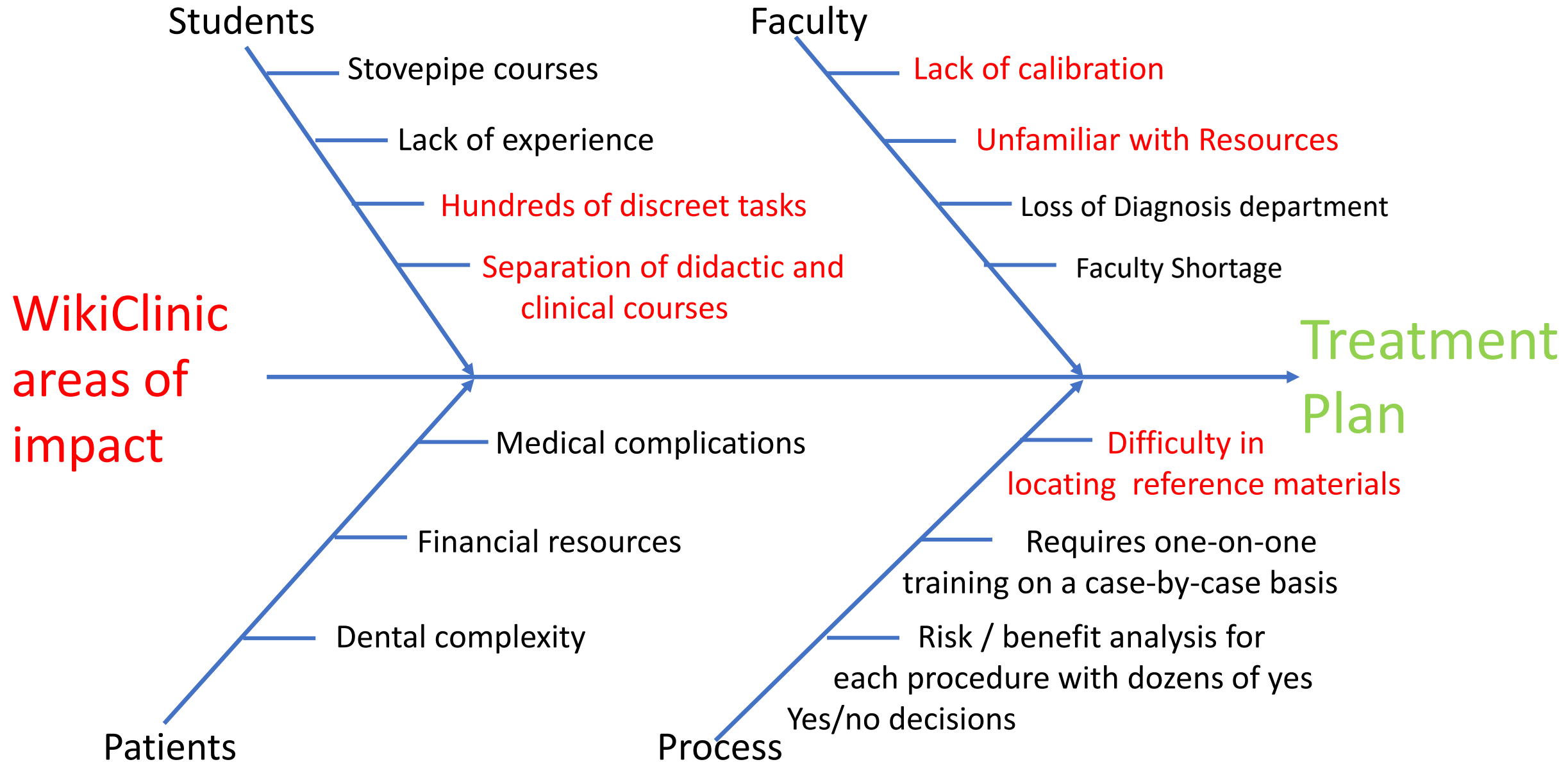
Aim Statement

To increase the level of confidence in treatment planning decisions from 4.6 to 6.0% by December 2017.

Complex treatment planning by phase

PHASE I | PHASE II | PHASE III | PHASE IV | PHASE V

Patient Reports

Pain
— Yes → **Emergency Treatment** — Complete →
— No →

Active Disease
— No → **Esthetics or function**
— Yes ↓

Extractions Restorations Prophylaxis Periodontal TX Root Canal Crowns
— Complex → **Refer**
— Complete →

Ortho Prosth Implants — Complete →

Esthetics or function
— Yes → Ortho Prosth Implants
— No →

Re-eval Tx complete
— Yes → **Recall**
— No → Complete

Cause & Effect Diagram

Students
- Stovepipe courses
- Lack of experience
- Hundreds of discreet tasks
- Separation of didactic and clinical courses

Faculty
- Lack of calibration
- Unfamiliar with Resources
- Loss of Diagnosis department
- Faculty Shortage

WikiClinic areas of impact

Treatment Plan

Patients
- Medical complications
- Financial resources
- Dental complexity

Process
- Difficulty in locating reference materials
- Requires one-on-one training on a case-by-case basis
- Risk / benefit analysis for each procedure with dozens of yes Yes/no decisions

Pre- Survey distributed to Third Year Dental Students

- 20 questions concerning student level of confidence in performing specific tasks that they will perform in the first months of clinic

- 10 point Likert scale where 1 was "I am not confident at all" and 10 was "I am very confident"

- 110 responses (100% participation)

- Focused on lowest mean student scores

- Formulate and record a multi-discipline dental treatment plan received a score of 4.63 out of 10

Pre-Survey Results recorded July 5, 2018

Task	Minimum	Maximum	Mean	Std Deviation	Variance	Count
Formulate and record a multi- discipline dental treatment plan	1	10	4.63	2.29	5.25	110
Locate materials, devices, and forms	1	10	5.12	2.47	6.09	110
Perform removable prosthodontic procedures	1	10	5.19	2.07	4.3	109
Overall, I feel well prepared to begin patient care	1	10	5.37	2.11	4.45	110
Make entries in the dental record using AxiUm	1	10	5.43	2.34	5.48	110
Detect and assess dental caries lesions	1	10	5.45	2.21	4.88	110
Recognize and remove caries	1	10	5.71	2.26	5.12	110
Perform scaling and root planing to remove subgingival calculus	1	10	5.78	2.48	6.13	110
Treatment plan for single crown restorations	1	10	5.84	2.26	5.1	109
Select and handle the appropriate restorative material	1	10	5.87	2.26	5.11	110
Present treatment options to my patient	1	10	5.89	2.52	6.37	109
Formulate a periodontal diagnosis	1	10	5.94	2.24	5.01	110
Adjust the occlusion and cement the crown	1	10	5.97	2.44	5.94	110
Perform dental restorative procedures	1	10	6.05	2.29	5.24	110
Make an endodontic diagnosis	1	10	6.19	2.29	5.23	110
Make an impression and provisionalize	1	10	6.26	2.32	5.39	110
Place, finish, and polish the restoration including occlusal adjustment	1	10	6.27	2.3	5.27	110
Prepare a tooth for restoration with a crown	1	10	6.63	2.22	4.92	110
Isolate the surgical site	1	10	6.81	2.29	5.23	110
Perform a Dental Examination	1	10	6.98	2.12	4.51	110

Average mean 5.87

Formulate and record a multi-discipline dental treatment plan
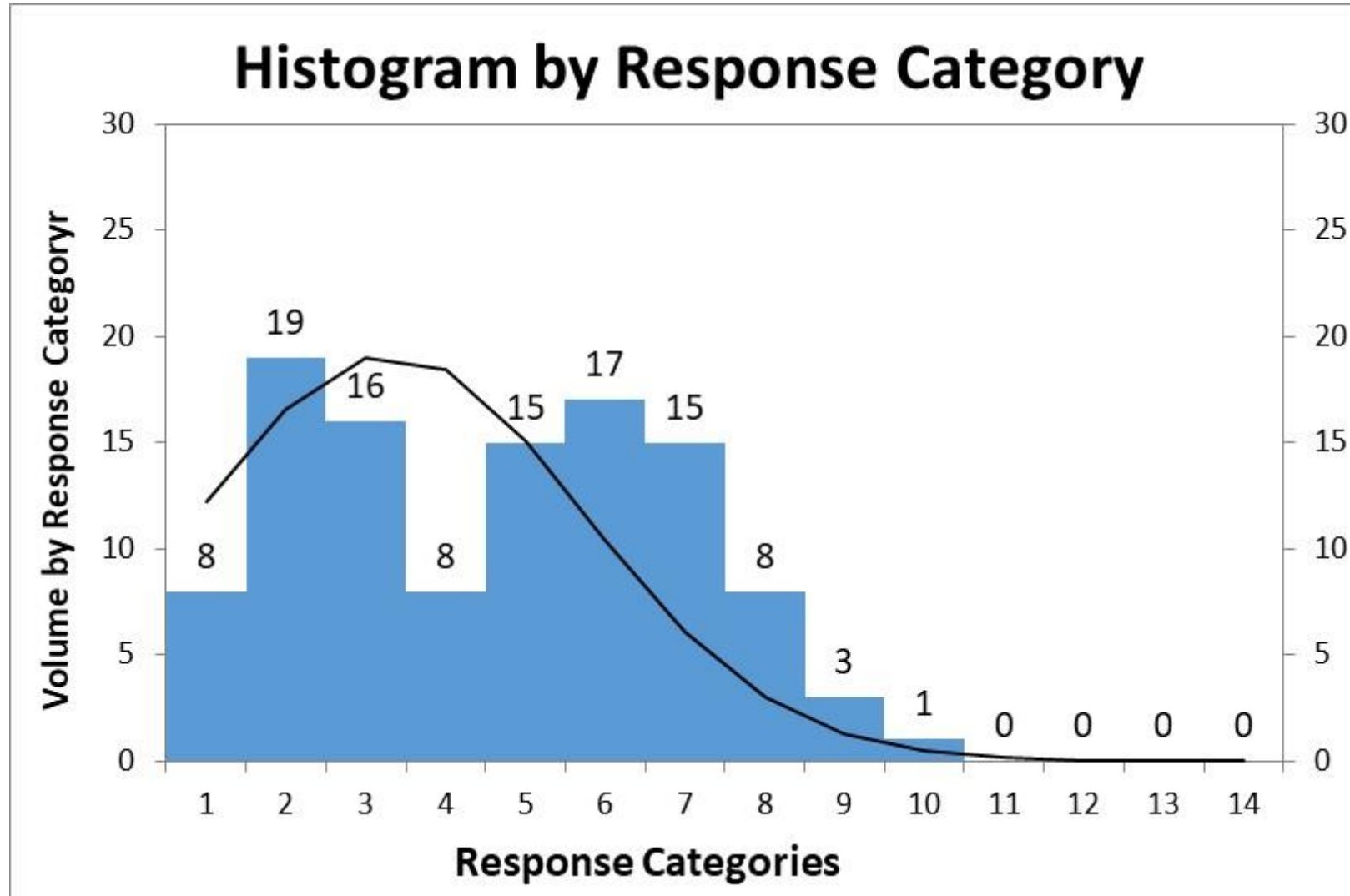
Action Plan

Aim Statement: To raise the level in confidence in treatment planning decisions for 4.6 to 6.0 percent by December of 2017.

Action Strength	Action Driver	Action	Who?	Why?	Start Date
Strong	Calibration of faculty	Approval of Dean and Chairs, presentation to the faculty on two occasions	Connor Littlestar MacNeill	Introduce WikiCLinic, Calibrate Faculty, Grant access, encourage participation	May 2017
Strong	Introduction of concept (students)	Presentation to students at orientation	Connor	Grant access, outline content, explain use	11 July
Strong	Pre-survey	Conduct survey to determine the level of confidence in tasks performed in the first months of clinic	Connor Littlestar MacNeill	Establish confidence level before using WikiClinic	11 July
Strong	Introduction of concept (faculty)	One-on-one meetings with faculty leaders	Connor, Littlestar	Explain content and use by students and faculty	Continuous since May
Strong	Student participation	Formation of student committee to identify improvement of content	Connor MacNeill	Teaching honors program students will work with professors to refine content and improve search function	September, October
Strong	Faculty Participation	Faculty members selected as advisors for student input	Connor MacNeill	Assure accuracy of web content	October
Strong	Post survey	Post exposure survey assess the impact of the process improvements	Connor Litlestar MacNeill	Assess the level of improvement in student confidence	02 November

What is a "Wiki"

- A Wiki is an open access web-based program that allows users to collaborate in creation and modification of content by use of a web browser.

- The first wiki was created in 1994 by Ward Cunningham and given the name "Wiki Wiki Web" from the Hawaiian word for "quick" The technology developed over the following decades to be used by individuals, corporations, and schools.

- The use of Wikis in medical education has been limited. 45 citations in PubMed

- A 2015 systematic review examined 25 Medical Wikis to determine their use and value in clinical practice of Medicine
    - Brulet A[1], Llorca G, Letrilliart L,**Medical wikis dedicated to clinical practice: a systematic review.** Med Internet Res. 2015 Feb 19;17

- A PubMed search shows only 4 articles on "Wikis in Dental Education"

WikiClinic Main Page

Welcome to the WikiClinic! You can search here for help with anything from clinic procedures, to protocols, or even Axium. Below are a few examples of the articles found on the wiki.
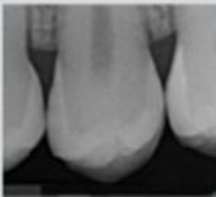
Contents [hide]

UT Health Center for Oral Health and Research

*I*nternational *C*aries *D*etection and *A*ssessment *S*ystem

American Dental Association Caries Classification System.

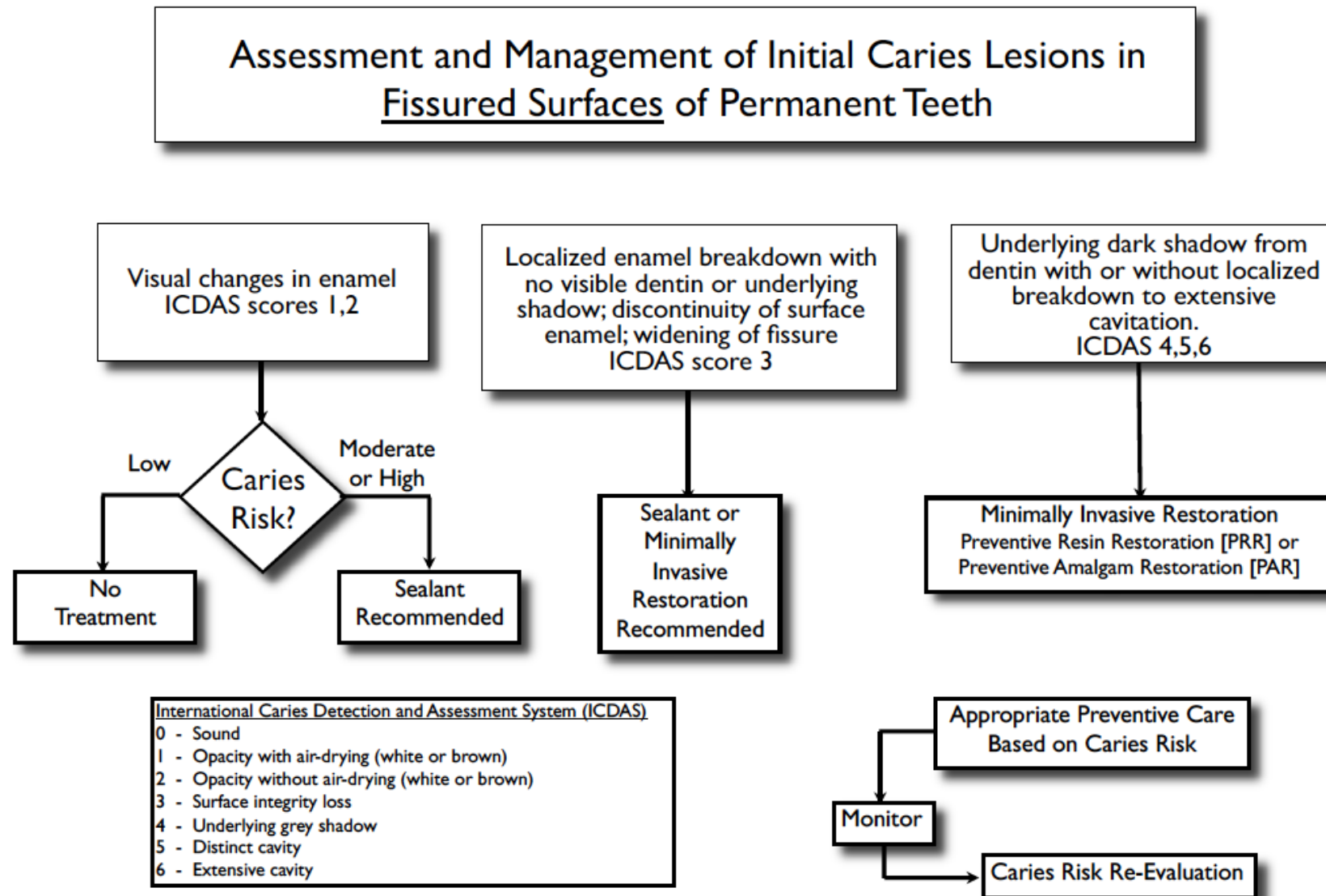|	AMERICAN DENTAL ASSOCIATION CARIES CLASSIFICATION SYSTEM			
	Sound	**Initial**	**Moderate**	**Advanced**
Clinical Presentation	No clinically detectable lesion. Dental hard tissue appears normal in color, translucency, and gloss.	Earliest clinically detectable lesion compatible with mild demineralization. Lesion limited to enamel or to shallow demineralization of cementum/dentin. Mildest forms are detectable only after drying. When established and active, lesions may be white or brown and enamel has lost its normal gloss.	Visible signs of enamel breakdown or signs the dentin is moderately demineralized.	Enamel is fully cavitated and dentin is exposed. Dentin lesion is deeply/severely demineralized.
Other Labels	No surface change or adequately restored	Visually noncavitated	Established, early cavitated, shallow cavitation, microcavitation	Spread/disseminated, late cavitated, deep cavitation
Infected Dentin	None	Unlikely	Possible	Present
Appearance of Occlusal Surfaces (Pit and Fissure)*[†]	ICDAS 0	ICDAS 1 ICDAS 2	ICDAS 3 ICDAS 4	ICDAS 5 ICDAS 6
Accessible Smooth Surfaces, Including Cervical and Root[†]				
Radiographic Presentation of the Approximal Surface[§]	E0[¶] or RO* No radiolucency	E1[¶] or RA1* E2[¶] or RA2* D1[¶] or RA3* Radiolucency may extend to the dentinoenamel junction or outer one-third of the dentin. Note: radiographs are not reliable for mild occlusal lesions.	D2[¶] or RB4* Radiolucency extends into the middle one-third of the dentin	D3[¶] or RC5* Radiolucency extends into the inner one-third of the dentin

* Photographs of extracted teeth illustrate examples of pit-and-fissure caries.
† The ICDAS notation system links the clinical visual appearance of occlusal caries lesions with the histologically determined degree of dentinal penetration using the evidence collated and published by the ICDAS Foundation over the last decade; ICDAS also has a menu of options, including 3 levels of caries lesion classification, radiographic scoring and an integrated, risk-based caries

UT Health Treatment Flowchart

Assessment and Management of Initial Caries Lesions in Fissured Surfaces of Permanent Teeth

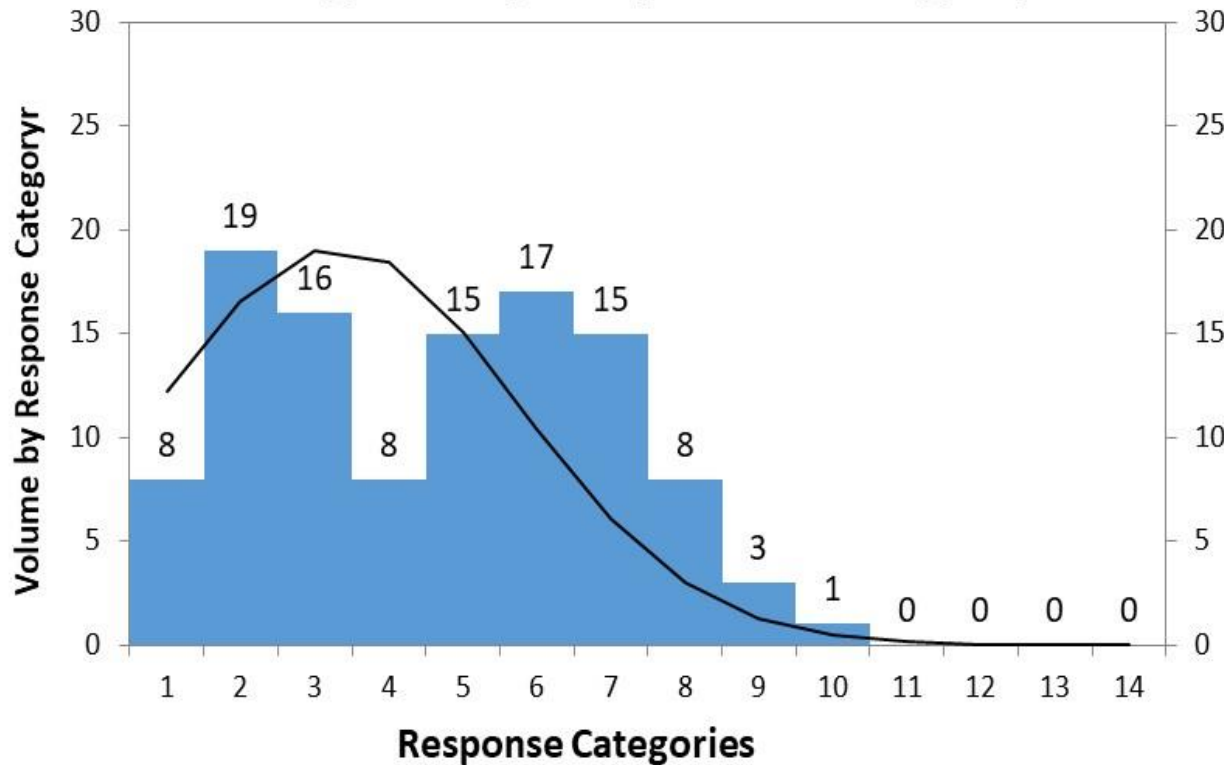# Post- Survey conducted November 2, 2018

- The same 20 questions were asked

- 105 total responses

- Designed to gauge specific improvements to confidence level as affected by use of WikiClinic

- Number of times WikiClinic was accessed

- Measure improvement in confidence in formulation of complex treatment plans

- Impact on reduction of clinical errors, increased use of time and productivity

Descriptive Statistical Summary of Survey Questions

Task	Pre-Survey Results						Post-Survey Results						Change
	Minimum	Maximum	Mean	Std Deviation	Variance	Count	Minimum	Maximum	Mean	Std Deviation	Variance	Count	% Change
Formulate and record a multi- discipline dental treatment plan	1	10	4.63	2.29	5.25	110	4	10	7.3	1.47	2.15	105	37
Locate materials, devices, and forms	1	10	5.12	2.47	6.09	110	3	10	7.26	1.69	2.85	104	30
Perform removable prosthodontic procedures	1	10	5.19	2.07	4.3	109	1	10	6.56	1.89	3.58	102	21
Overall, I feel well prepared to begin patient care	1	10	5.37	2.11	4.45	110	3	10	7.39	1.44	2.08	104	23
Make entries in the dental record using AxiUm	1	10	5.43	2.34	5.48	110	3	10	8.32	1.48	2.2	105	35
Detect and assess dental caries lesions	1	10	5.45	2.21	4.88	110	3	10	7.25	1.63	2.66	105	25
Recognize and remove caries	1	10	5.71	2.26	5.12	110	3	10	7.5	1.61	2.59	105	24
Perform scaling and root planing to remove subgingival calculus	1	10	5.78	2.48	6.13	110	2	10	7.72	1.72	2.95	104	25
Treatment plan for single crown restorations	1	10	5.84	2.26	5.1	109	3	10	7.81	1.77	3.14	104	26
Select and handle the appropriate restorative material	1	10	5.87	2.26	5.11	110	4	10	7.78	1.45	2.09	105	25
Present treatment options to my patient	1	10	5.89	2.52	6.37	109	2	10	7.76	1.53	2.35	105	26
Formulate a periodontal diagnosis	1	10	5.94	2.24	5.01	110	3	10	7.74	1.58	2.48	104	21
Adjust the occlusion and cement the crown	1	10	5.97	2.44	5.94	110	3	10	7.49	1.93	3.71	97	19
Perform dental restorative procedures	1	10	6.05	2.29	5.24	110	4	10	7.75	1.48	2.19	105	23
Make an endodontic diagnosis	1	10	6.19	2.29	5.23	110	3	10	7.83	1.58	2.51	103	21
Make an impression and provisionalize	1	10	6.26	2.32	5.39	110	2	10	7.57	1.77	3.13	100	19
Place, finish, and polish the restoration including occlusal adjustment	1	10	6.27	2.3	5.27	110	3	10	8.14	1.55	2.41	104	23
Prepare a tooth for restoration with a crown	1	10	6.63	2.22	4.92	110	2	10	7.48	1.78	3.17	100	11
Isolate the surgical site	1	10	6.81	2.29	5.23	110	4	10	7.88	1.44	2.06	103	13
Perform a Dental Examination	1	10	6.98	2.12	4.51	110	4	10	8.45	1.36	1.85	105	18

Q3 -- Formulate and record a multi- discipline dental treatment plan
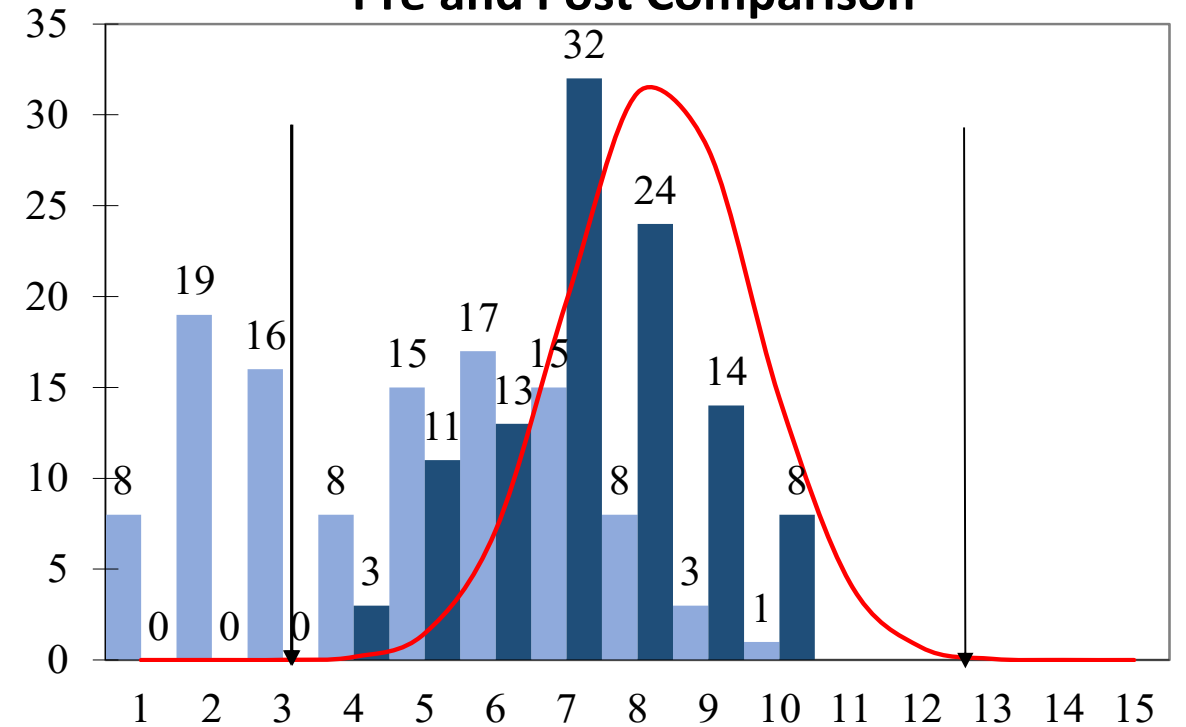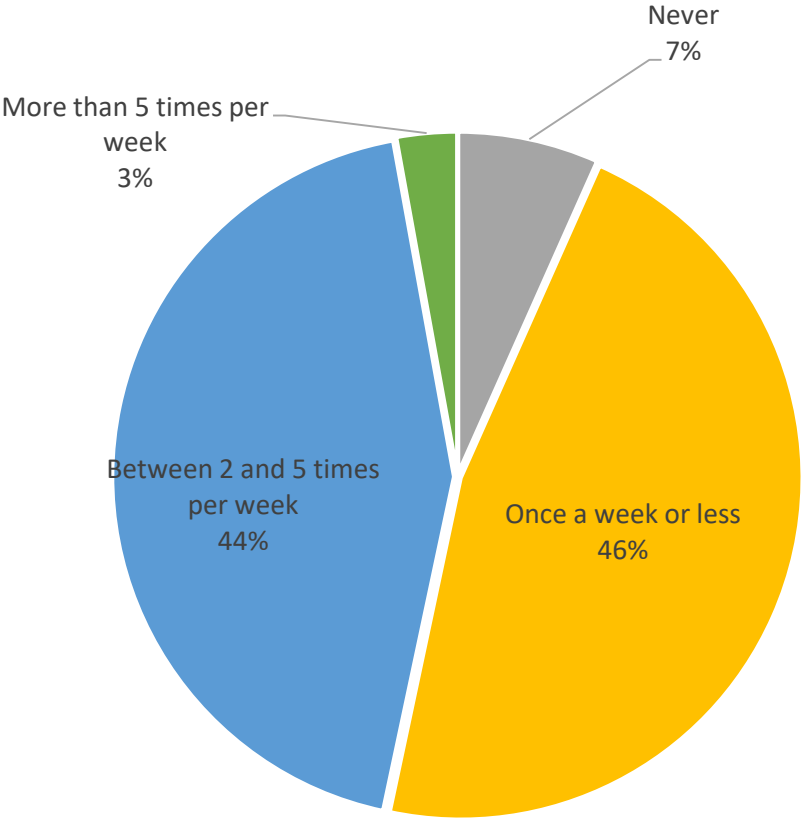
Post- Survey results

- Average mean for all tasks 7.65

- Average gain in self assessment of student confidence was 27.8 percent for all 20 tasks

- Highest gain was 37 percent for "formulate and record a multi-discipline treatment plan"

- Unpaired Student T test results
  - 0.0078
  - Statistically significant 95% confidence interval
  - The null hypothesis was rejected

Return on Investment

- Frequency of student access in the first months of clinic

- Impact on:
  - Reduction of errors
  - Increase in productivity
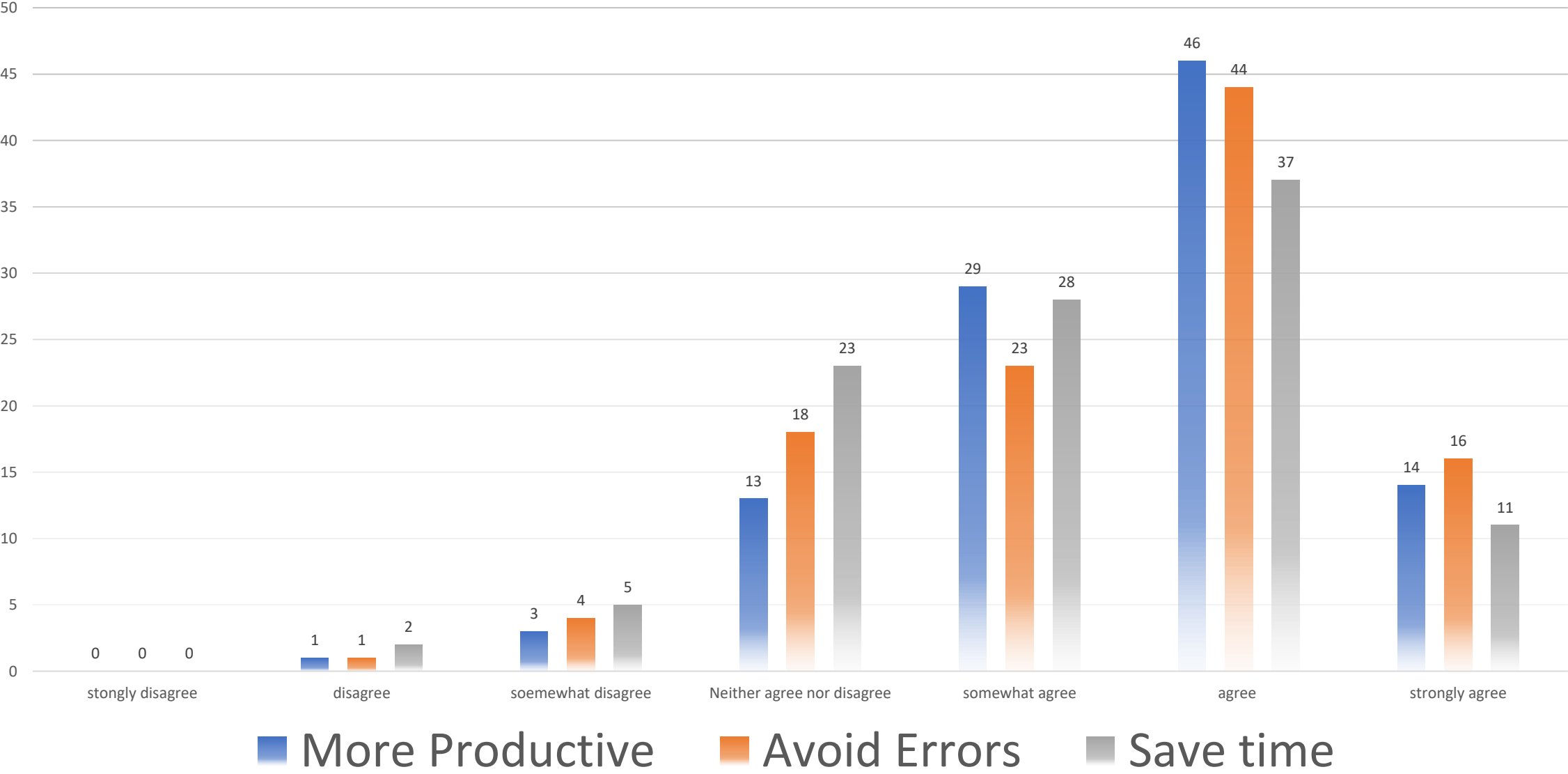 - More efficient use of time in the clinic

Return on Investment

105 RESPONSES

Pie chart:
- Never 7%
- More than 5 times per week 3%
- Between 2 and 5 times per week 44%
- Once a week or less 46%

	Agree	Disagree
Avoid errors	73	5
Increase productivity	89	4
Save time	76	7

POST-SURVEY RESPONSES

Maintaining the Gains Post Survey and Next Steps

- Increase faculty participation

- Publish our results in the Journal of Dental Education

- Encourage student input in creation of content as a part of the Teaching Honors Program

- Develop technical infrastructure within the school

- Improve the WikiClinic search function

- Analyze trends in use of content

- Monitor the relationship between reduction in errors and improvement in use of time and productivity

Thank You