DentalCharting
Clinic Management

e-Charting – Public Health Data Acquisition Efficacy Via Undergraduate Dental Students

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Mr. Wouter Put

FDI World Dental Congress

Free Communication

Madrid

08.30.2017

Purpose

To evaluate a curriculum-based study to compare the ability of undergraduate dental students to

- *master and utilize e-Charting methods versus traditional analog methods (paper-based charting)*
- *in determining the potential effects of increasing available manpower resource allocation*
- *as well as increasing significant insight for dental epidemiological database creation*

Rationale

- *Lack of governmental priority*
- *Lack of governmental funding support*
- *Limitations in dental professional manpower*
- *Limited numbers of MPH and DPH professionals*
- *Limited numbers of epidemiologists in the field*
- *Need for reliable, up-to-date oral health databases*

Particularly in developing nations…

fdi POZNAŃ 2016
Annual World Dental Congress
Poznań, Poland
September 7-10. 2016
DentalCharting
Clinic Management

Precedent

An eChart for each child

Dr. Clarissa Jane F. Pe

6 weeks

60 volunteer dentists trained in e-charting

42 Philippine schools

8,000 school children

Precedent Results

Feasibility was clearly demonstrated that large scale public oral health surveys could be met by utilizing the digital e-Charting platform deployed within a coordinated organizational approach

YET, ONE YEAR LATER:

- *No up-to-date Philippines public oral health data*
- *2011 most recent data from the DOH and funding sequestered until fiscal 2018 or beyond*
- *Reported by FDI in 2014, Philippines #1 in caries incidence in Asia*
- *No furtherance of past success via enlarged programs of the Philippine Dental Association although memoranda of agreement still exist*

Methods

- 198 dental students – Sophomore to Senior
- 2 week online training in e-charting
- Virtual patient comparison of analog- and e-charting
- Gold standard pro forma evaluation
- 50 students selected to serve as clinician candidates
- 10 students chosen to serve as Student Research Assistants (SRA)
- SRA's randomly assigned patients from a 200 sample population, 20-80 y.o.a.
- SRA's randomly performed either analog- or e-charting and were evaluated on a gold standard pro forma
- Data was measured for performance time, errors in consistency, as well as data recording accuracy
- Student attitudinal survey also deployed post-facto
- Time = 12 mos.

e-CHARTING vs. PAPER

The Virtual Patient

SPICE, NEMO — **TIME ALLOWABLE: 45 min.**

Male — **MHX FACTS: 7**
DOB: JUL 30, 1987

HX: Hospitalization – C-Section; 2008
Bowel obstruction; 2010
Blood Type = A+

BASELINE — **BASELINE DATA: 62**

Tooth #:

18	Missing; Extracted
17	Occluso-lingual composite restoration; Lingual caries; ICDAS 3
16	Occluso-lingual composite restoration; Occlusal recurrent caries; ICDAS
15	Disto-occlusal composite restoration
14	Occlusal composite restoration
13	Sound tooth; ICDAS 0
12	Sound tooth; ICDAS 0
11	Facial caries; ICDAS 3
21	Facial caries; ICDAS 3
22	Sound tooth; ICDAS 0
23	Sound tooth; ICDAS 0
24	Occlusal composite restoration
25	Sound tooth; ICDAS 0
26	Occlusal composite restoration; occlusal recurrent caries; ICDAS 2
27	Occlusal composite restoration; Buccal composite restoration
28	Missing; Extracted

e-CHARTING vs. PAPER

The Virtual Patient

BASELINE
Tooth #:

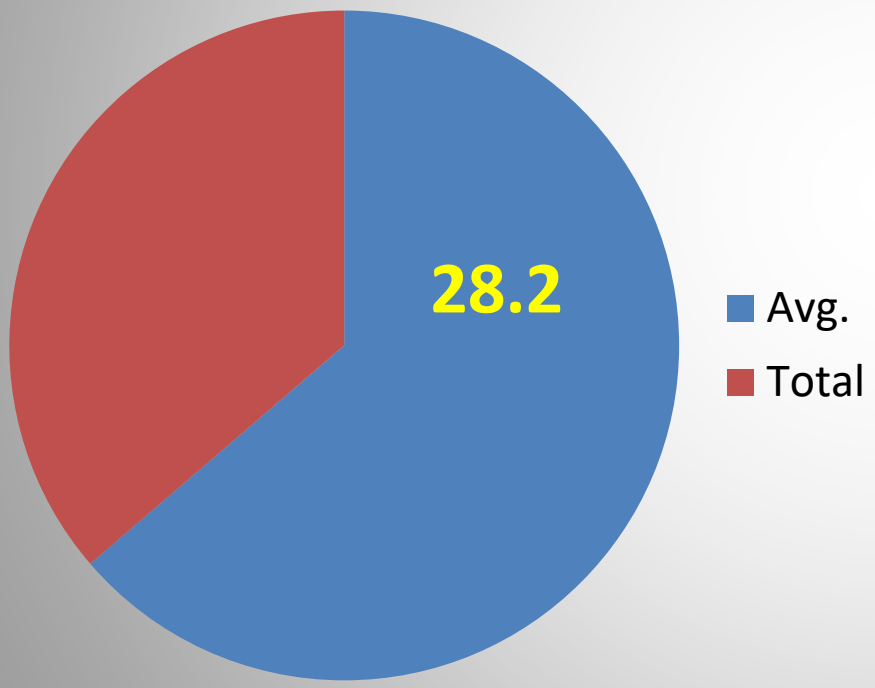
38	**Sound tooth; ICDAS 0**
37	**Occlusal composite restoration; Linguo-occluso-buccal caries; ICDAS**
36	**Occlusal composite restoration; Buccal composite restoration**
35	**Occlusal composite restoration**
34	**Occlusal composite restoration**
33	**Sound tooth; ICDAS 0**
32	**Sound tooth; ICDAS 0**
31	**Missing tooth; replaced by Removable Partial Denture**
41	**Missing tooth; replaced by Removable Partial Denture**
42	**Sound tooth; ICDAS 0**
43	**Sound tooth; ICDAS 0**
44	**Sound tooth; ICDAS 0**
45	**Porcelain Fused to Metal Crown**
46	**Porcelain Fused to Metal Crown**
47	**Occlusal composite restoration; Occluso-buccal caries; ICDAS 2**
48	**Missing; Extracted**

198 STUDENTS
47 MALES 151 FEMALES

e-CHARTING vs. PAPER

The Virtual Patient – Time

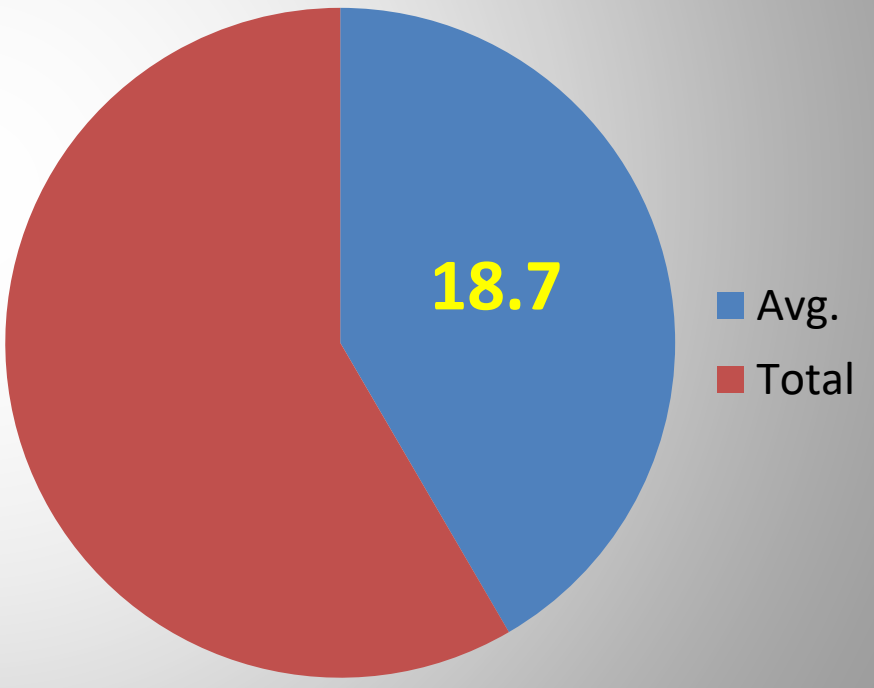
PAPER



63.7%

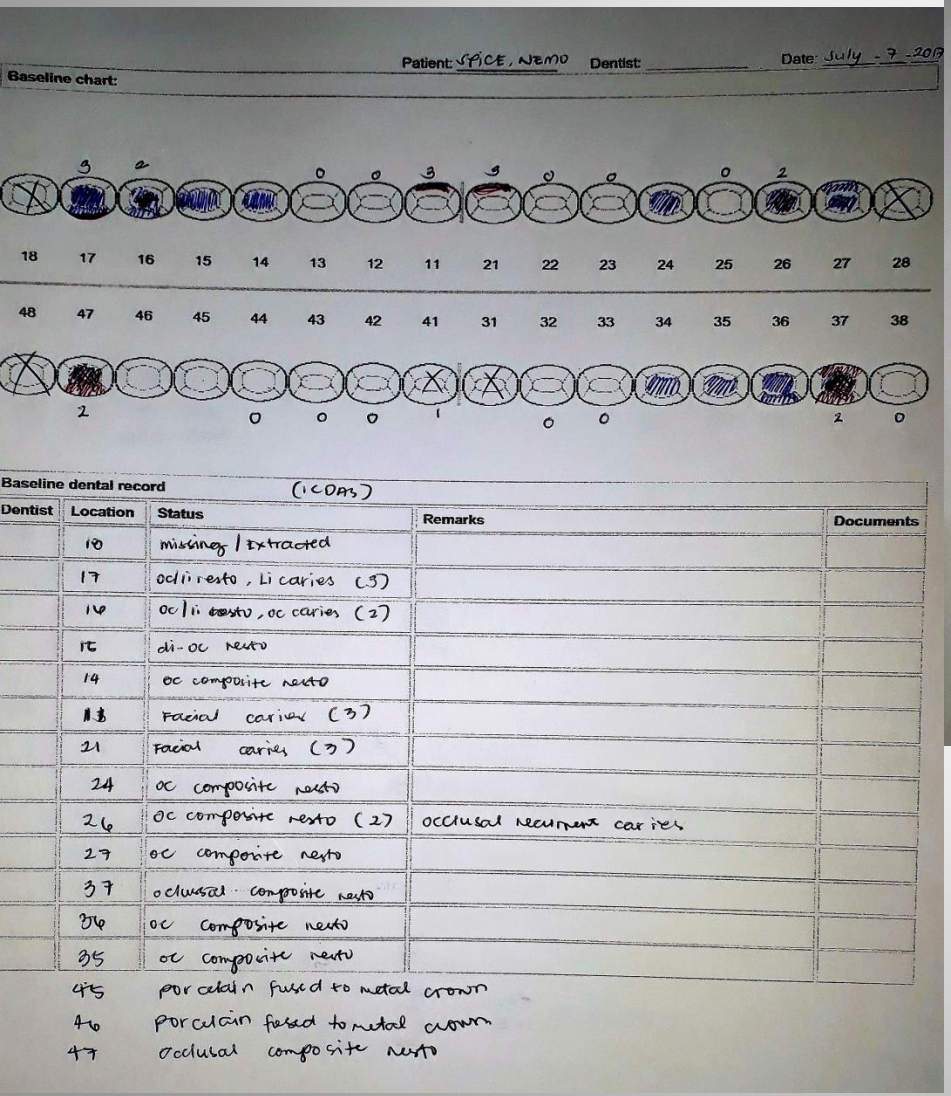
45 Min.

e-CHART



41.6%

Paper… Inconsistencies



Patient: SPICE, NEMO Dentist: Date: July - 7 - 2017

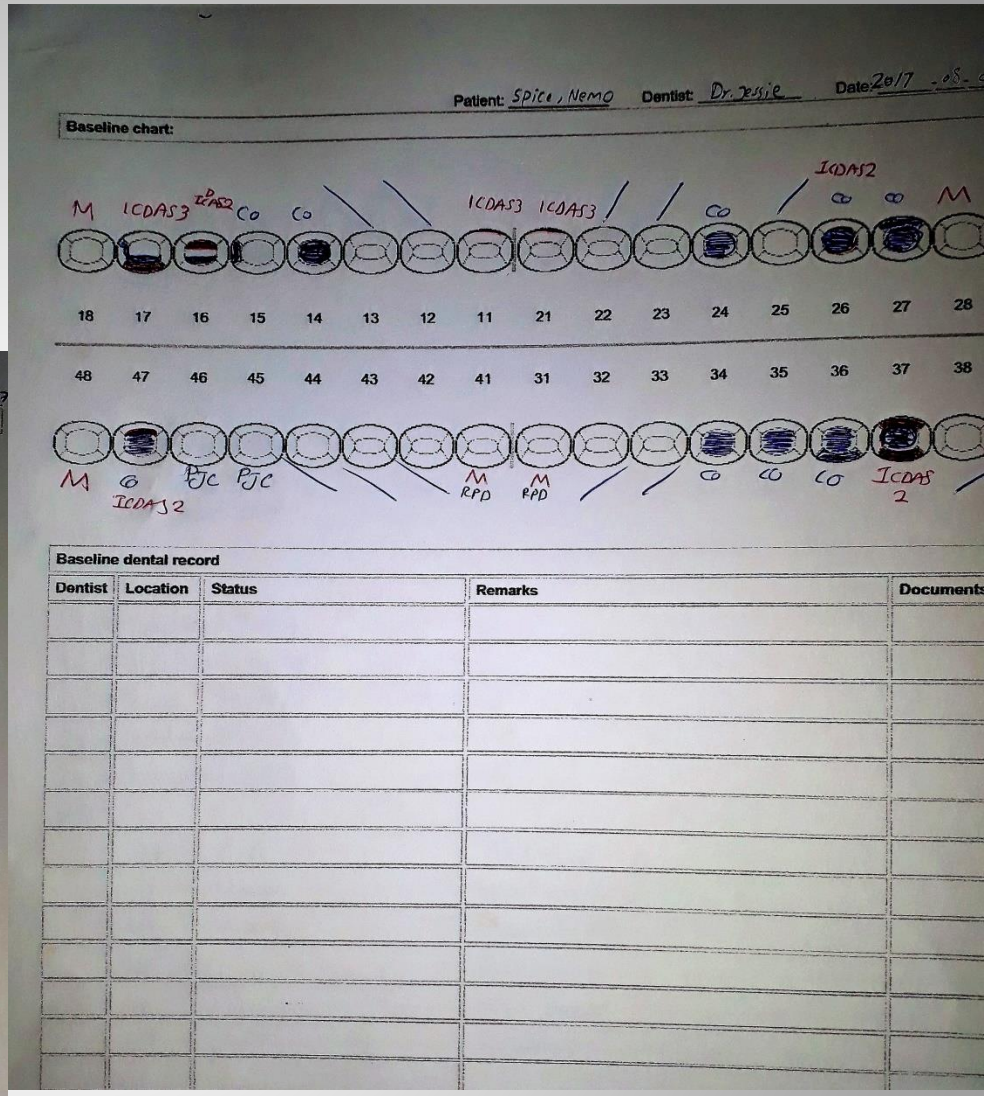
Baseline chart:

18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
	3	2			0	0	3	3	0	0		0	2		

48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
	2			0	0	0	1		0	0				2	0

Baseline dental record (ICDAS)

Dentist	Location	Status	Remarks	Documents
	18	missing / extracted		
	17	occl/i resto, Li caries (3)		
	16	oc/li resto, oc caries (2)		
	15	di-oc resto		
	14	oc composite resto		
	13	Facial caries (3)		
	21	Facial caries (3)		
	24	oc composite resto		
	26	oc composite resto (2)	occlusal recurrent caries	
	27	oc composite resto		
	37	occlusal composite resto		
	36	oc composite resto		
	35	oc composite resto		
	45	porcelain fused to metal crown		
	46	porcelain fused to metal crown		
	47	occlusal composite resto		



Patient: Spice, Nemo Dentist: Dr. Jessie Date: 2017 - 05 -

Baseline chart:

18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
M	ICDAS3	ICDAS2	Co	Co			ICDAS3	ICDAS3			Co	ICDAS2	Co	Co	M

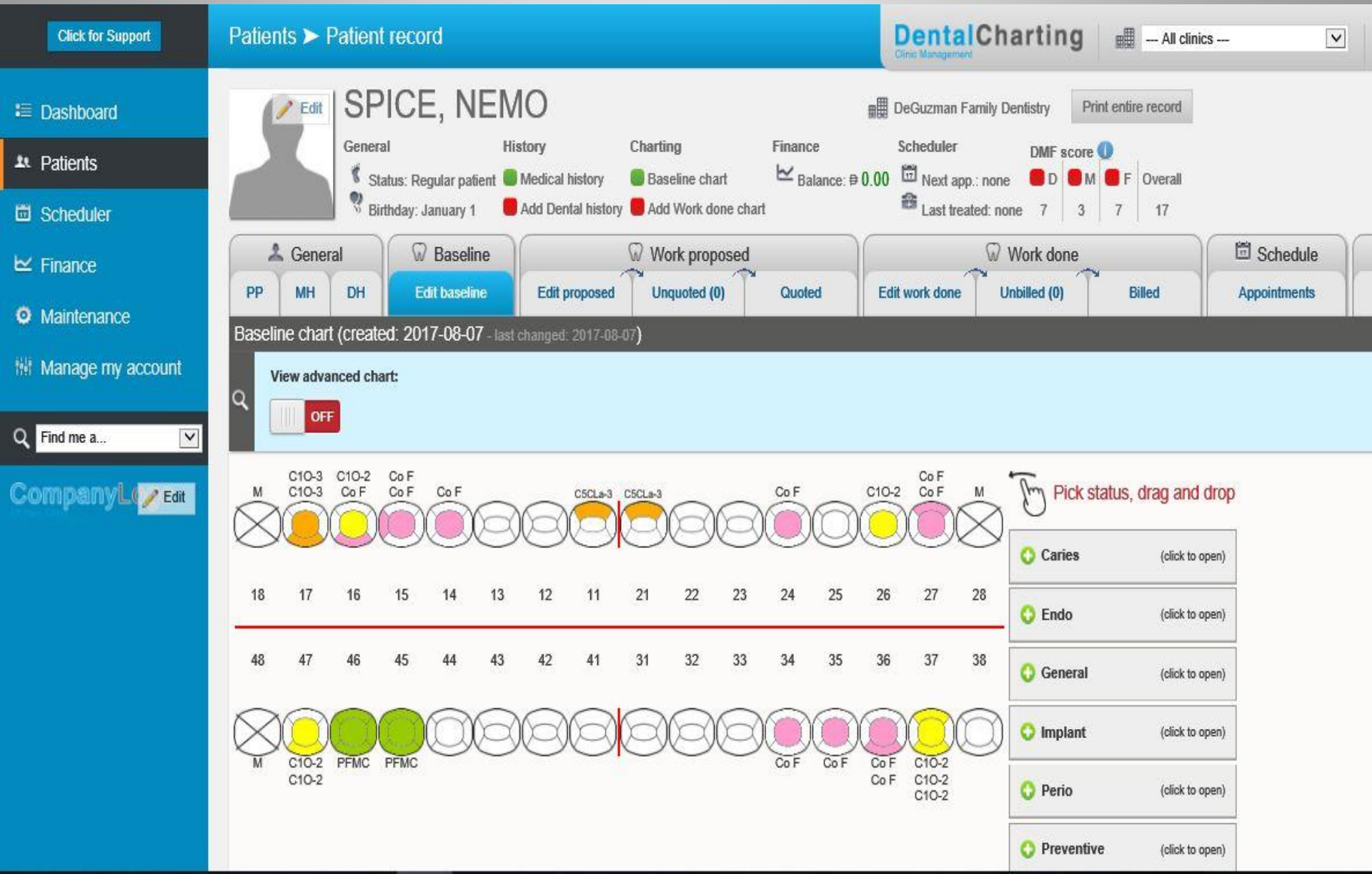
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
M	Co ICDAS2	PJC	PJC				M RPD	M RPD			Co	Co	Co	ICDAS 2	

Baseline dental record

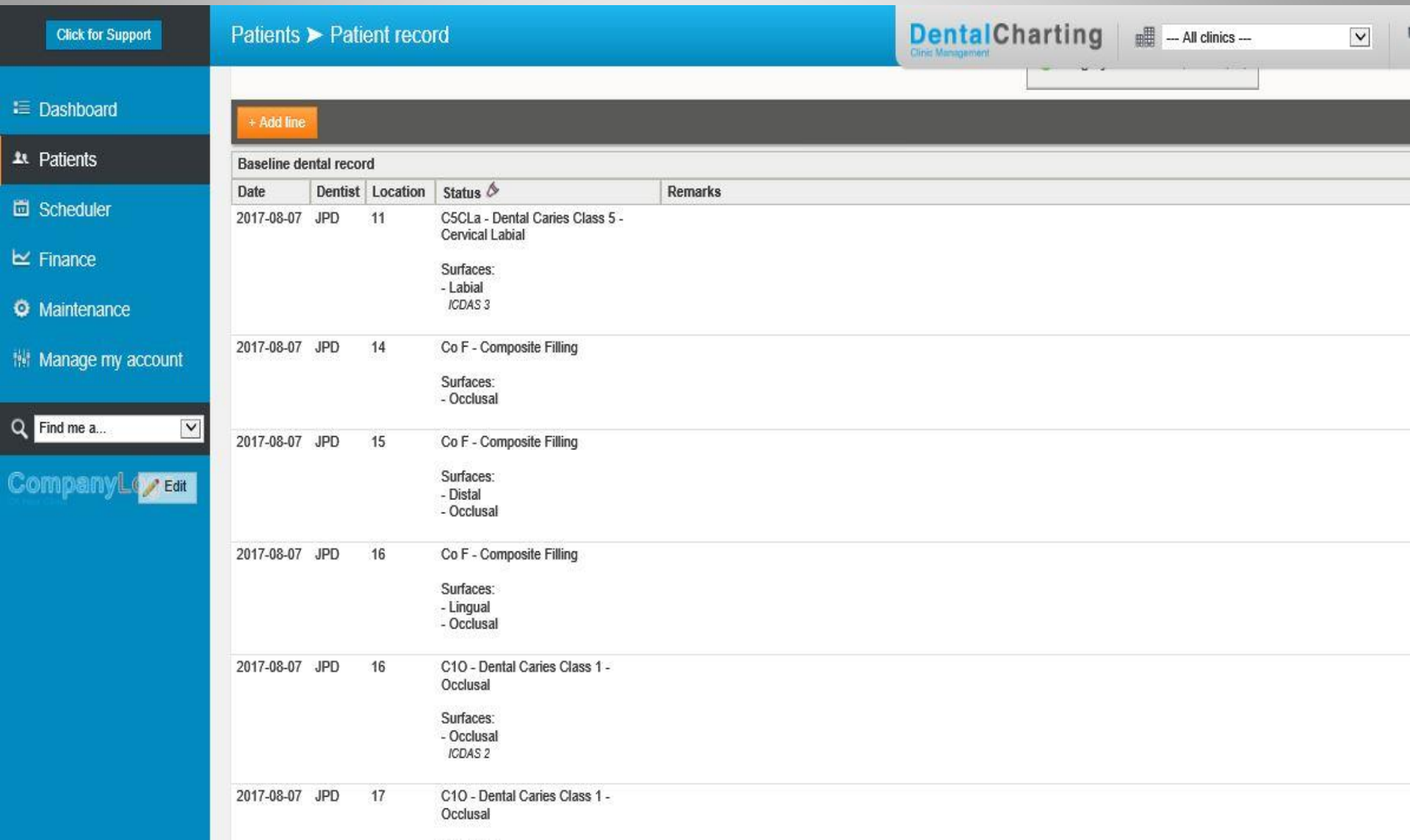
Dentist	Location	Status	Remarks	Documents

… errors, and omissions

e-CHARTING vs. PAPER



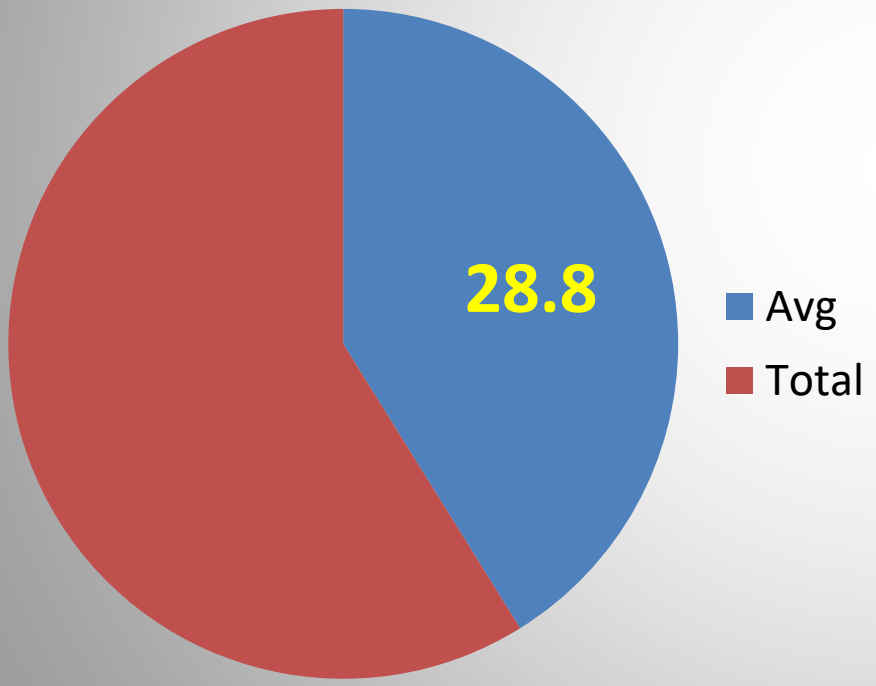
e-CHARTING vs. PAPER



e-CHARTING vs. PAPER

The Virtual Patient – Consistency Errors

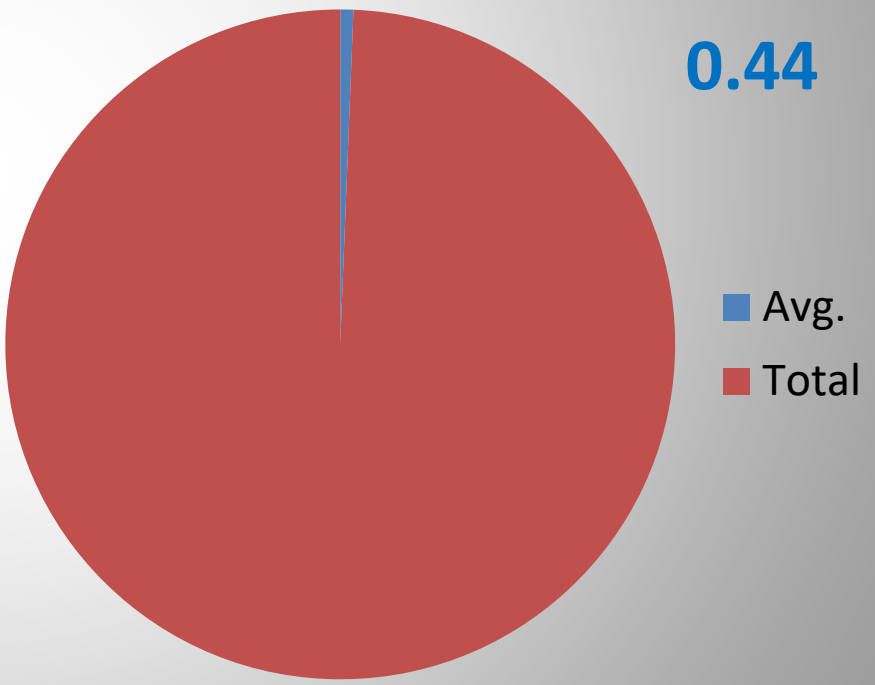
PAPER MHX



41.14%

70 Data points

e-CHART MHX

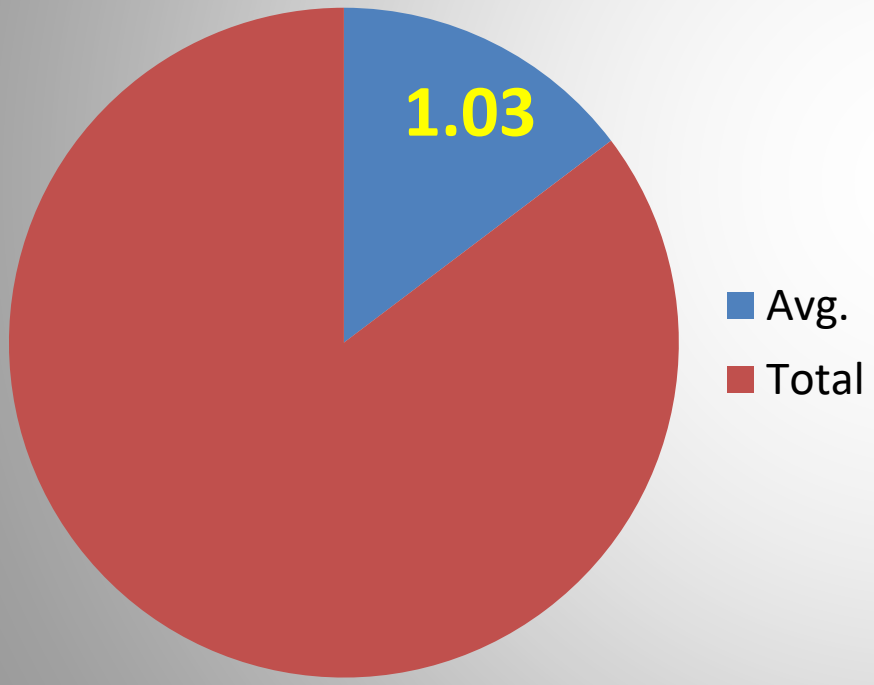


0.63%

e-CHARTING vs. PAPER

The Virtual Patient – Data Accuracy

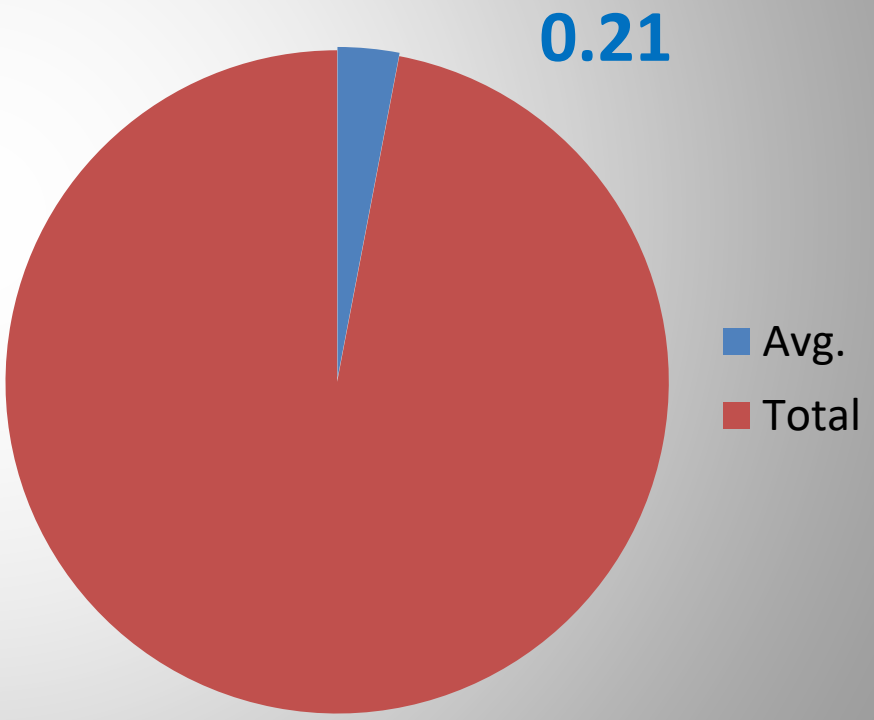
PAPER MHX



14.7%

7 Data points

e-CHART MHX

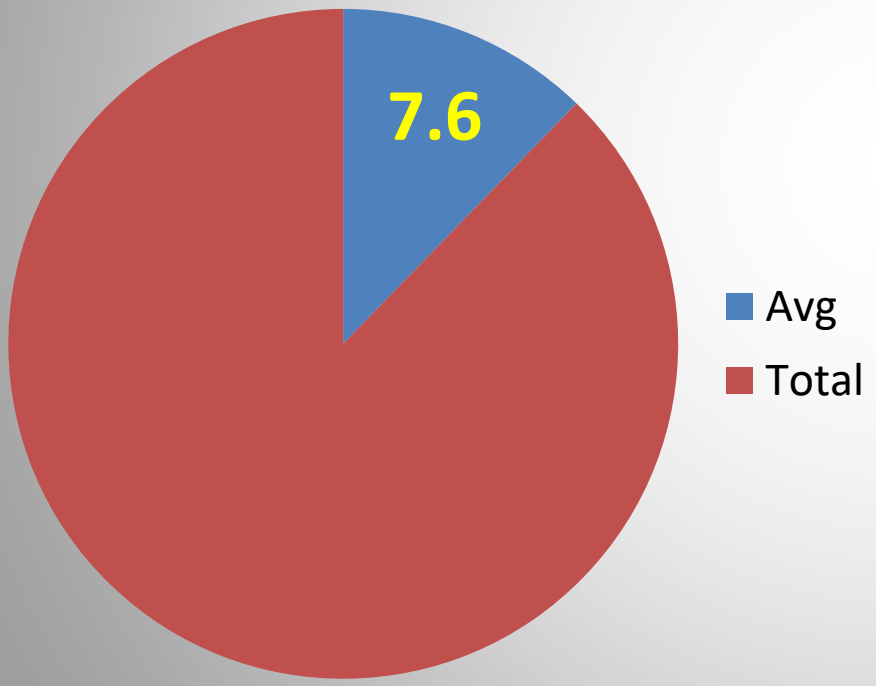


3.0%

e-CHARTING vs. PAPER

The Virtual Patient – Consistency Errors

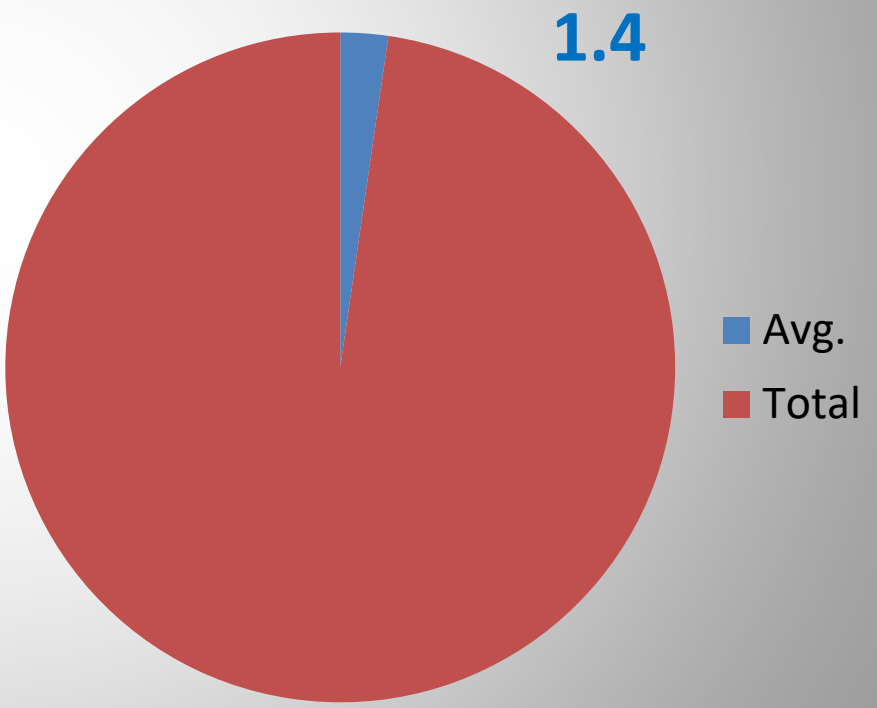
PAPER DENTAL CHART



12.26%

62 Data points

e-DENTAL CHART

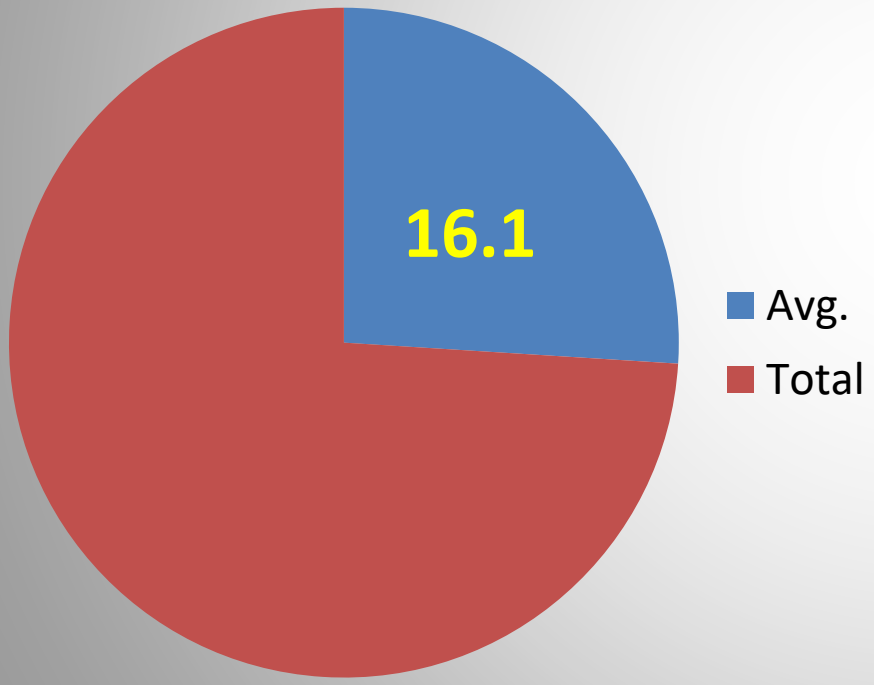


2.3%

e-CHARTING vs. PAPER

The Virtual Patient – Data Accuracy

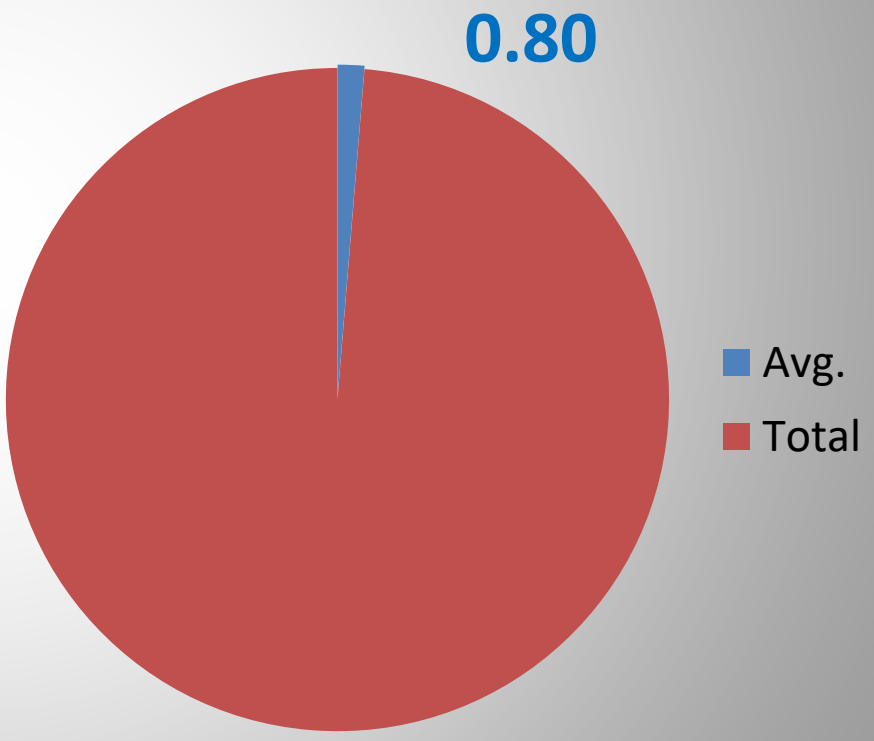
PAPER DENTAL CHART



26.0%

62 Data points

e-DENTAL CHART



1.3%

Student Research Assistants

J. DeGuzman **A. Bakhtiyari**

L. Yazouri **J. Sangalang** **S. Sinco**

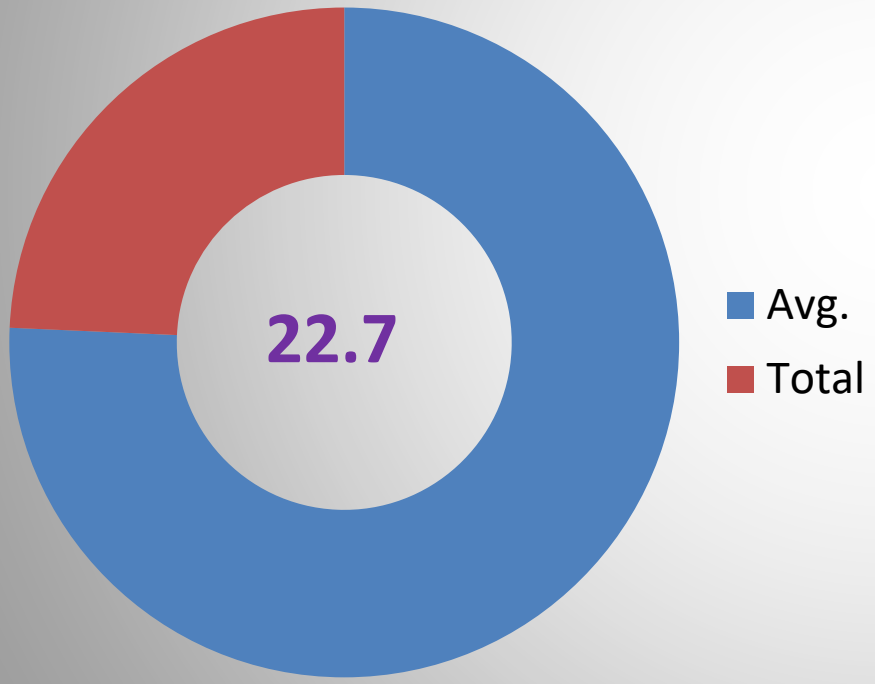
L. Goto **M. Cortuna**

C. Apolonio **D. Pauco**

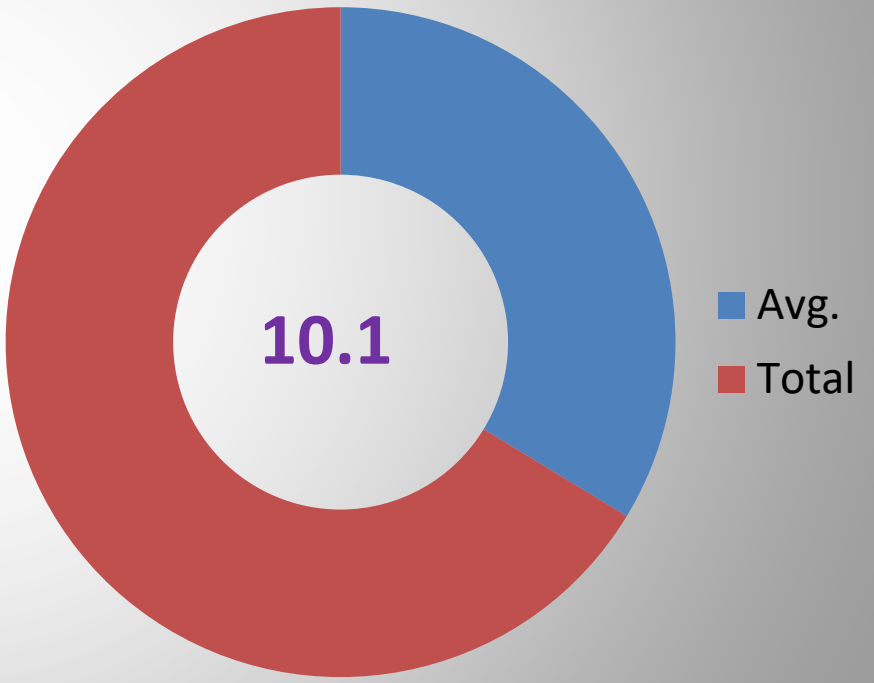
e-CHARTING vs. PAPER

The Clinical Patient – Time

PAPER



e-CHART

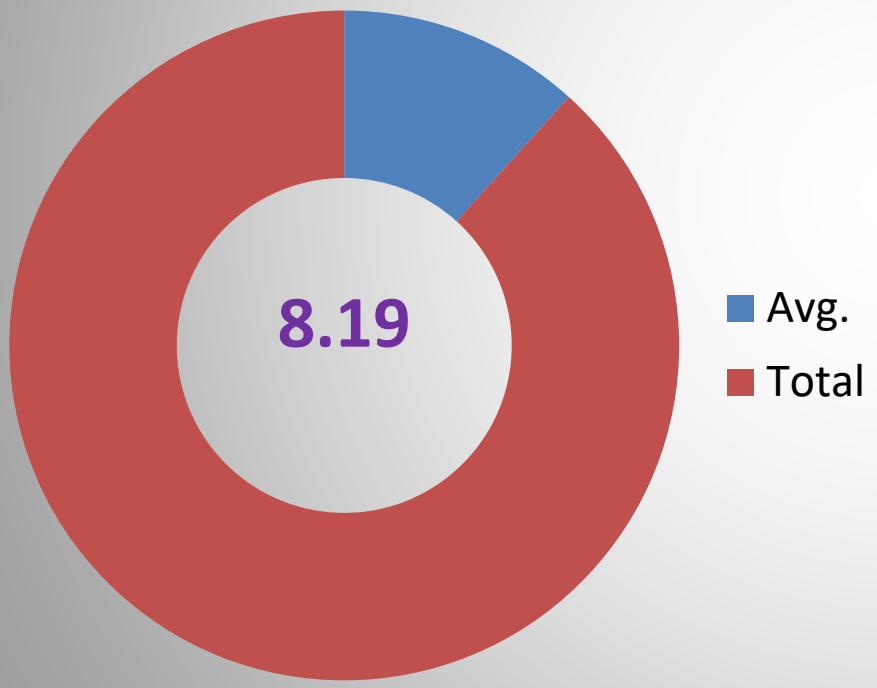


75.7% **30 Min.** **33.7%**

e-CHARTING vs. PAPER

The Clinical Patient – Consistency Errors

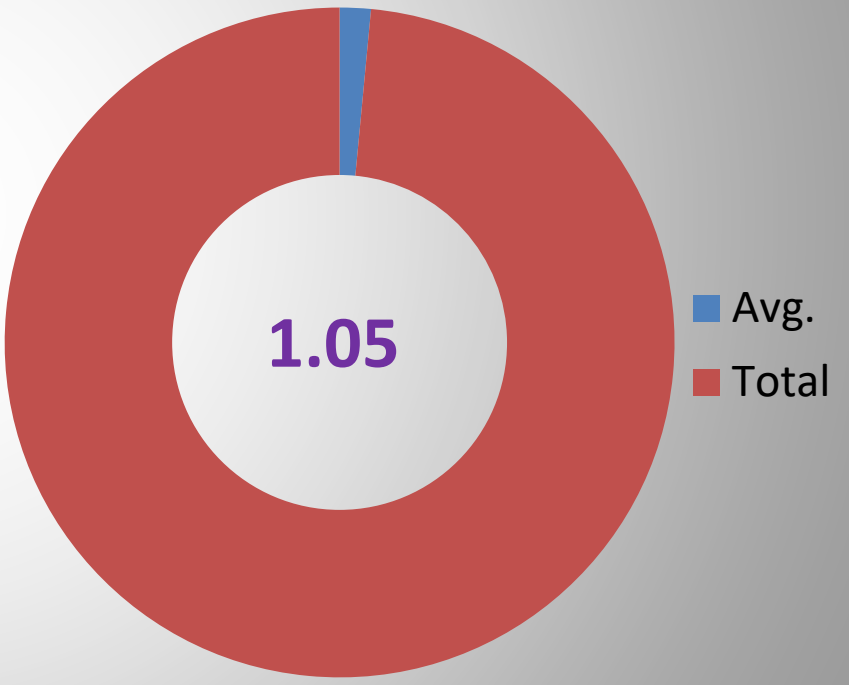
PAPER MHX



11.7%

70 Data Points

e-CHART MHX

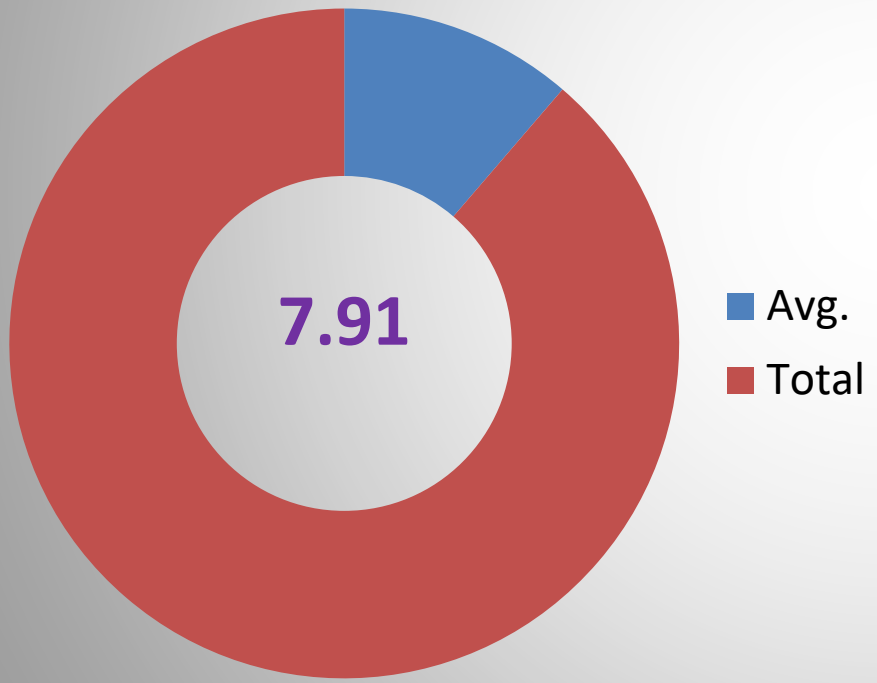


1.5%

e-CHARTING vs. PAPER

The Clinical Patient – Data Accuracy

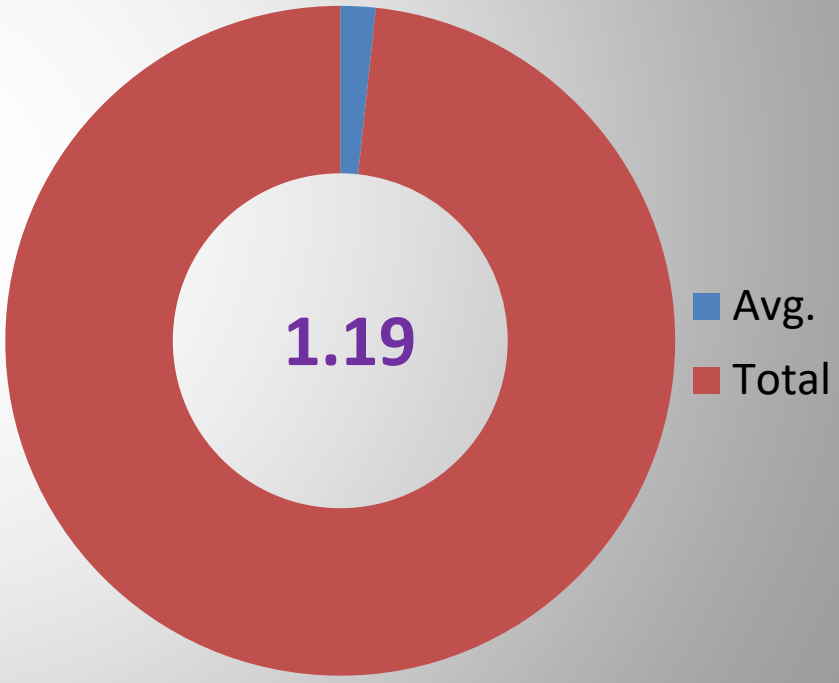
PAPER MHX



11.3%

70 Data Points

e-CHART MHX

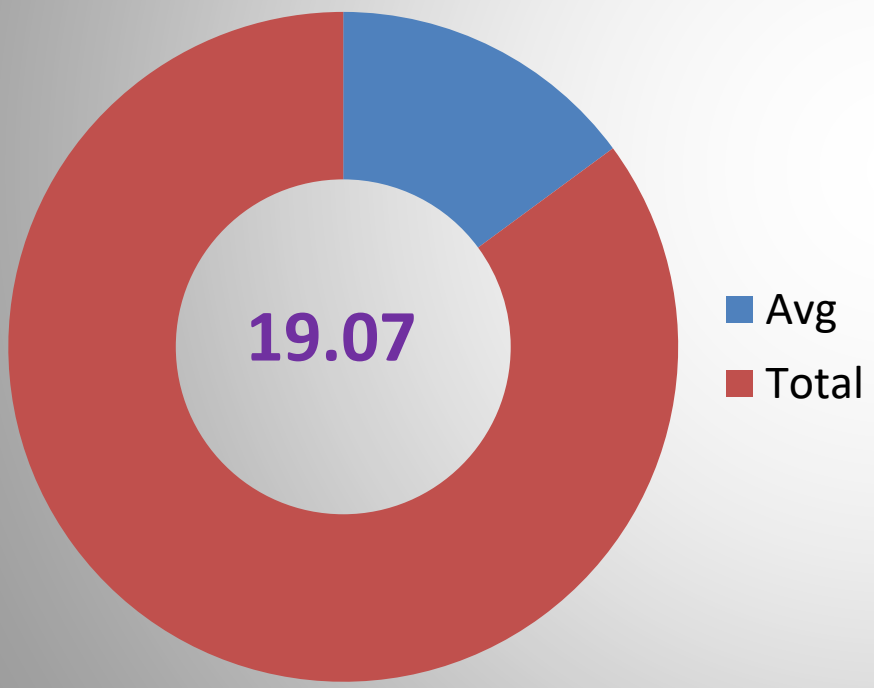


1.7%

e-CHARTING vs. PAPER

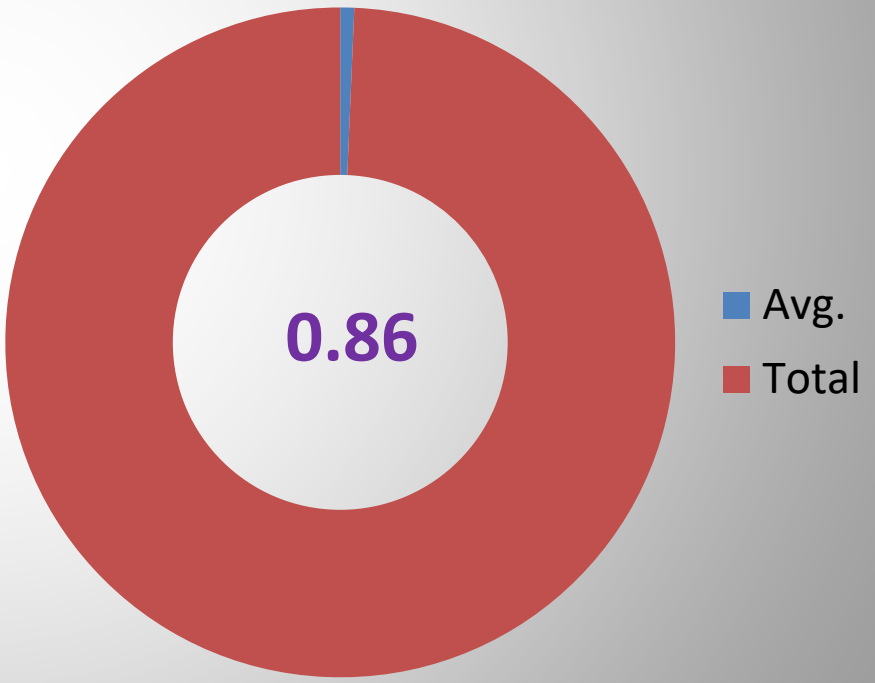
The Virtual Patient – Consistency Errors

PAPER DENTAL CHART



14.9%

e-DENTAL CHART



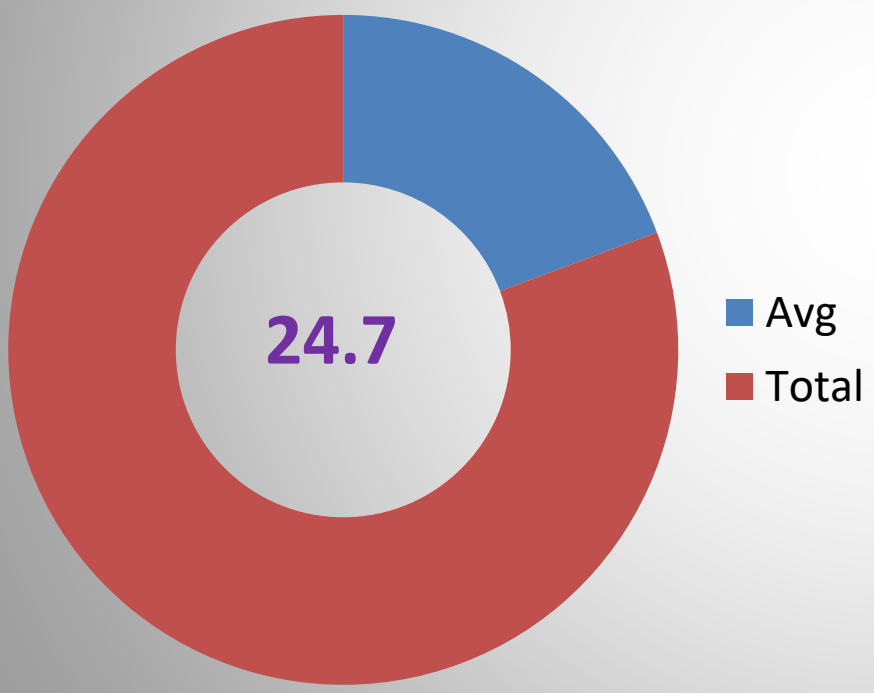
0.67%

14,976 Data points

e-CHARTING vs. PAPER

The Virtual Patient – Data Accuracy

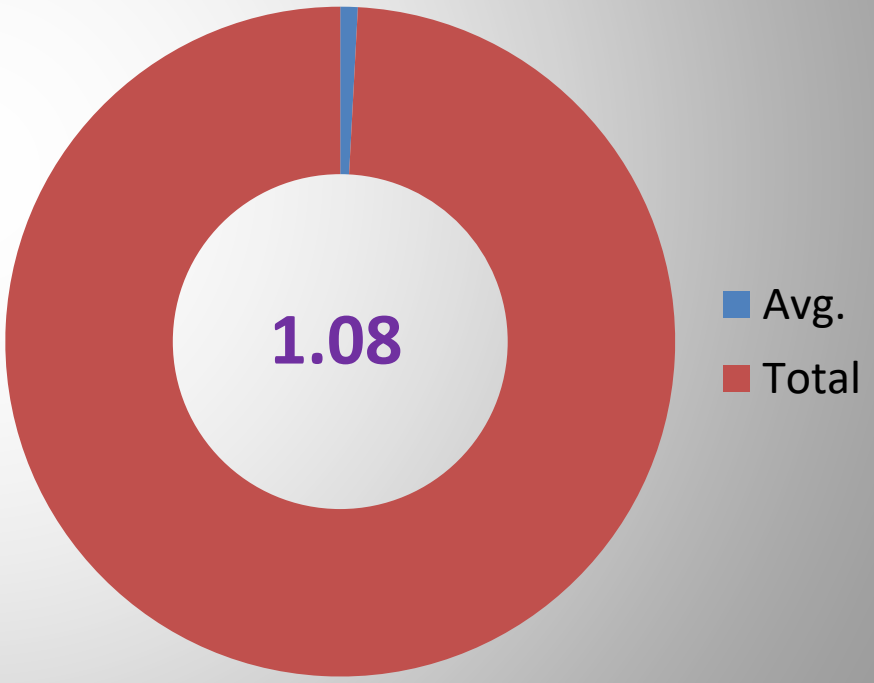
PAPER DENTAL CHART



19.3%

14,976 Data points

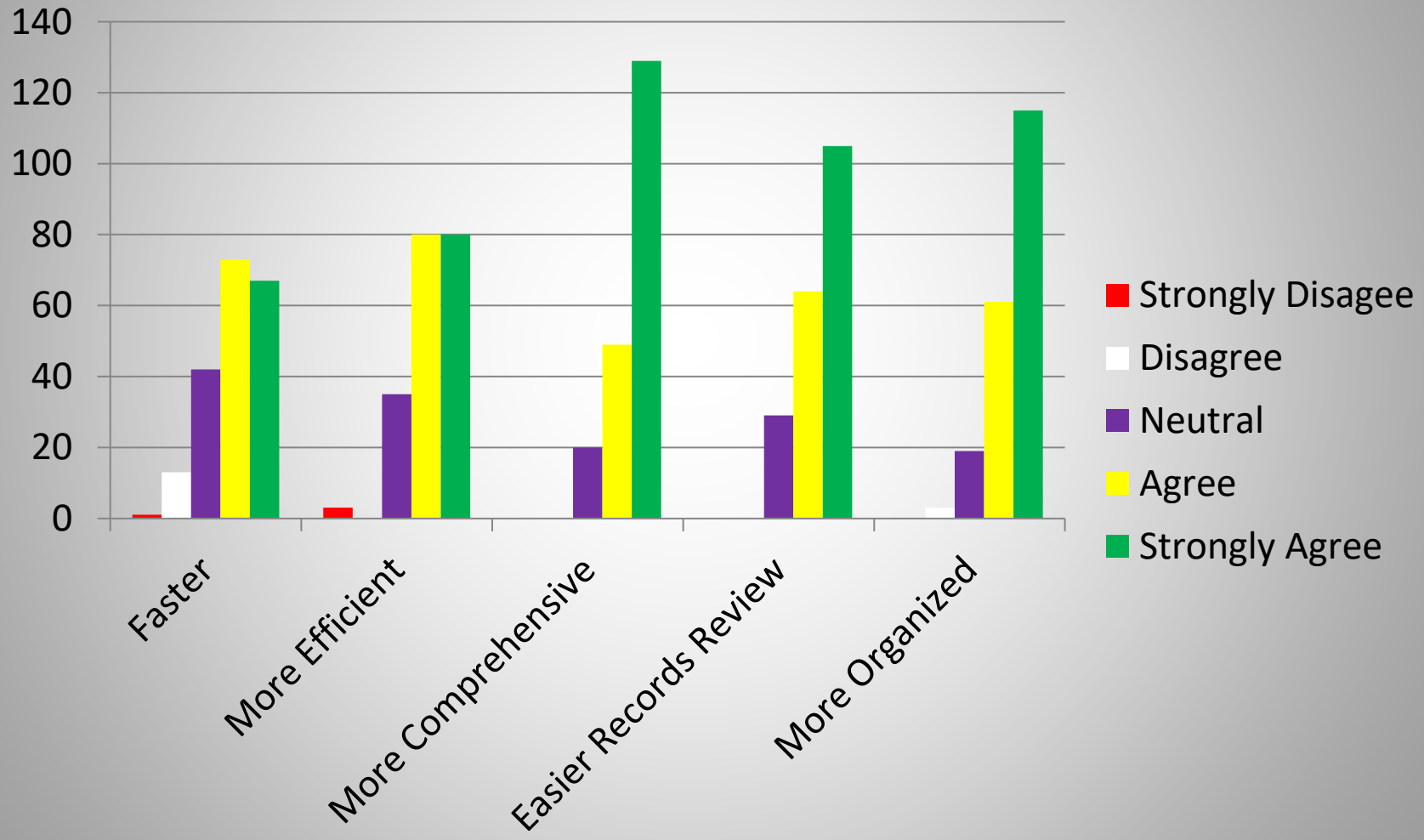
e-DENTAL CHART



0.84%

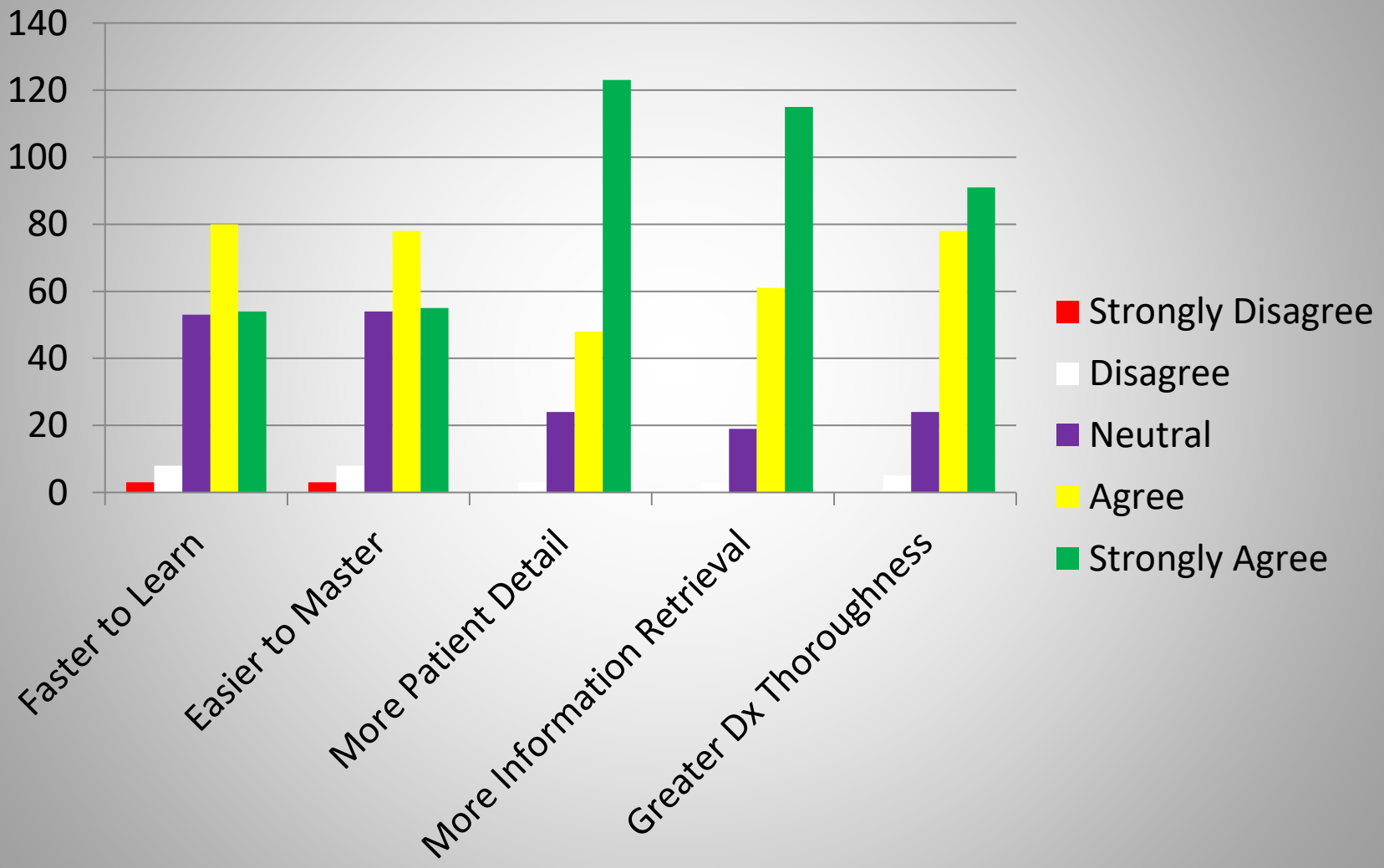
	PAPER	e-CHART
Time		
Virtual	**28.2**	**18.7**
Clinical	**22.7**	**10.1**
MHX Consistency Errors		
Virtual	**28.8**	**0.44**
Clinical	**8.90**	**1.05**
MHX Data Accuracy		
Virtual	**1.03**	**0.21**
Clinical	**7.91**	**1.19**
Chart Consistency Errors		
Virtual	**7.60**	**1.40**
Clinical	**19.07**	**0.86**
Chart Data Accuracy		
Virtual	**16.1**	**0.80**
Clinical	**24.7**	**1.08**

e-CHARTING vs. PAPER



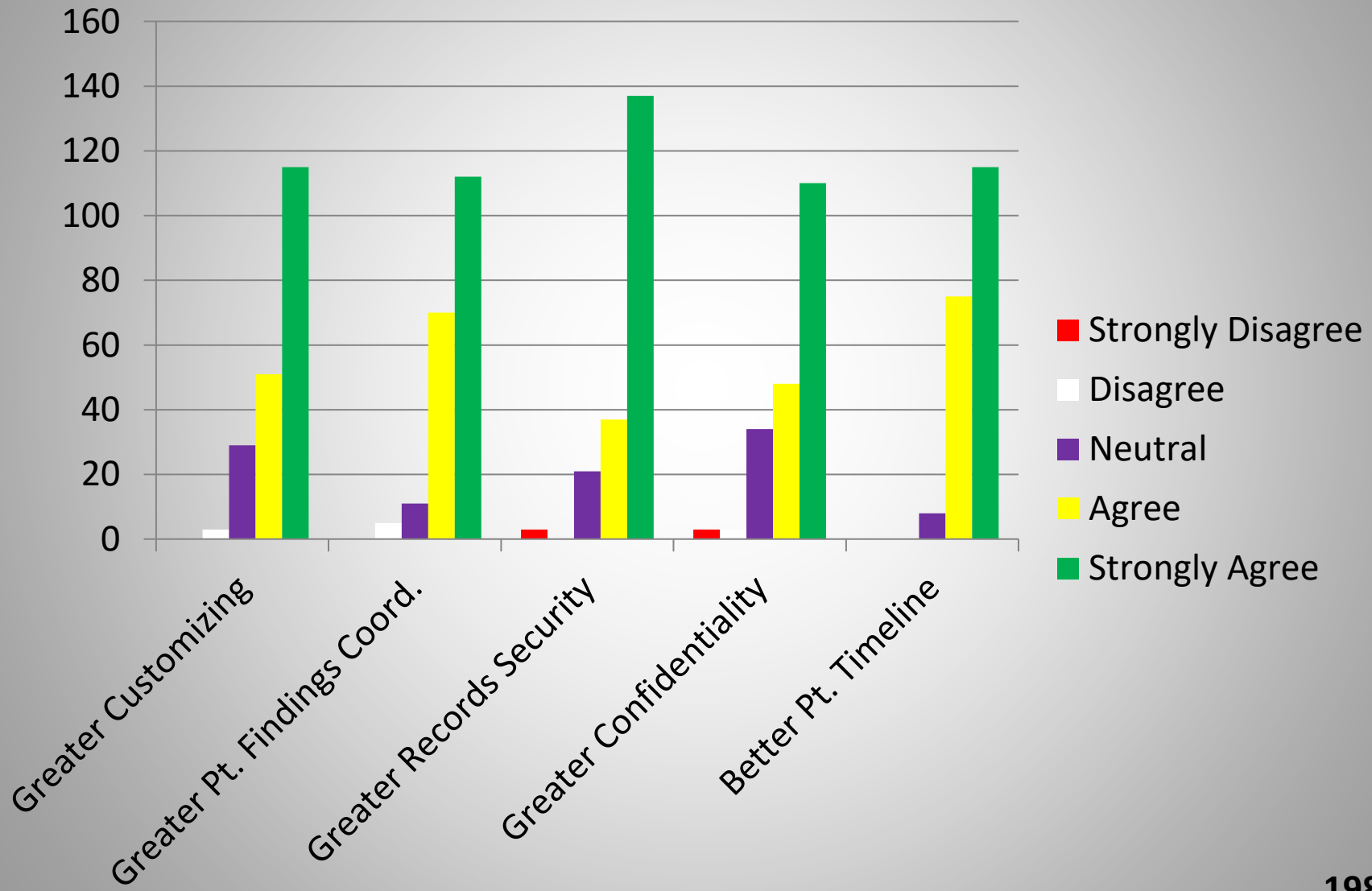
198 Respondents

e-CHARTING vs. PAPER



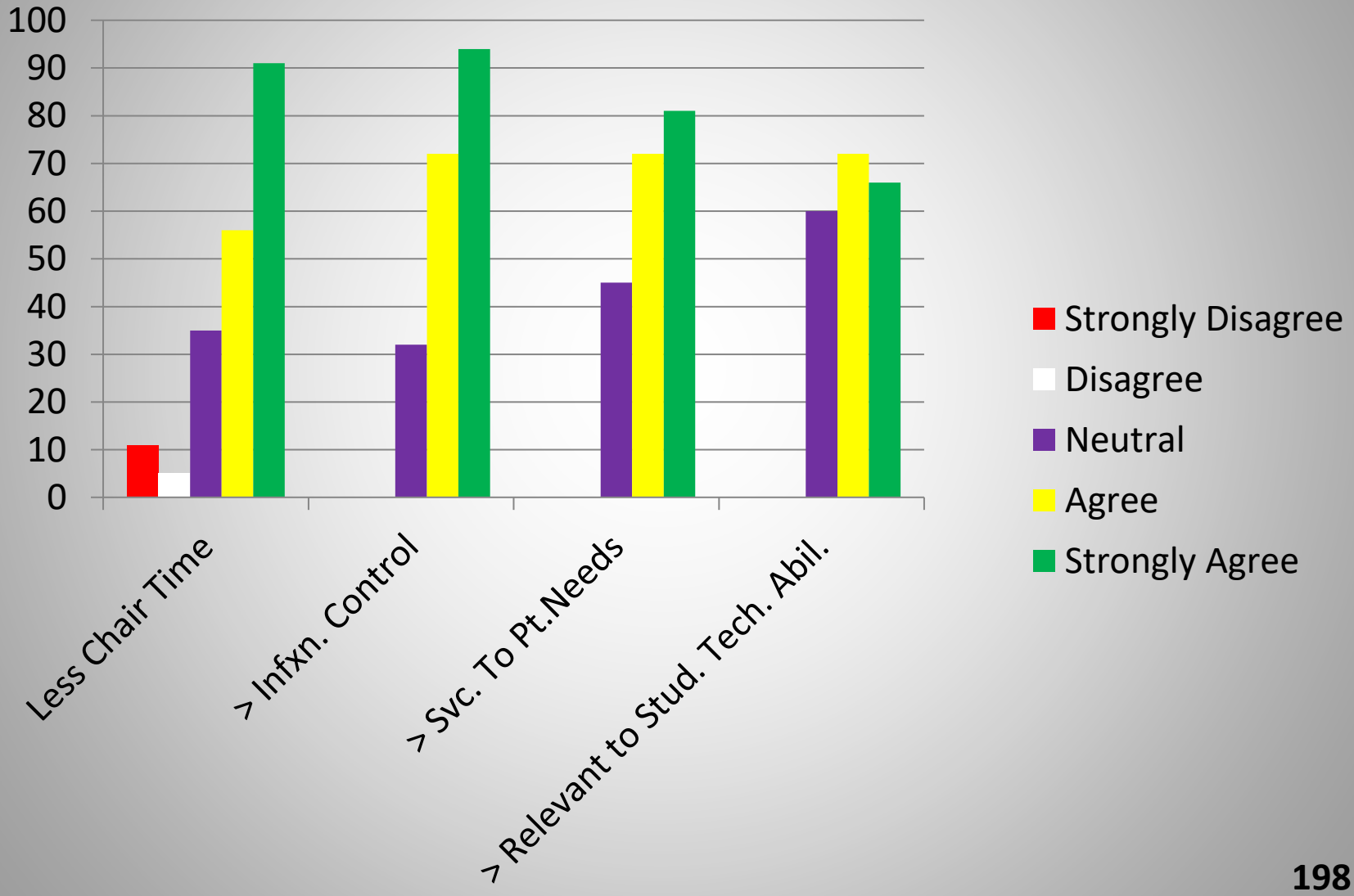
198 Respondents

e-CHARTING vs. PAPER



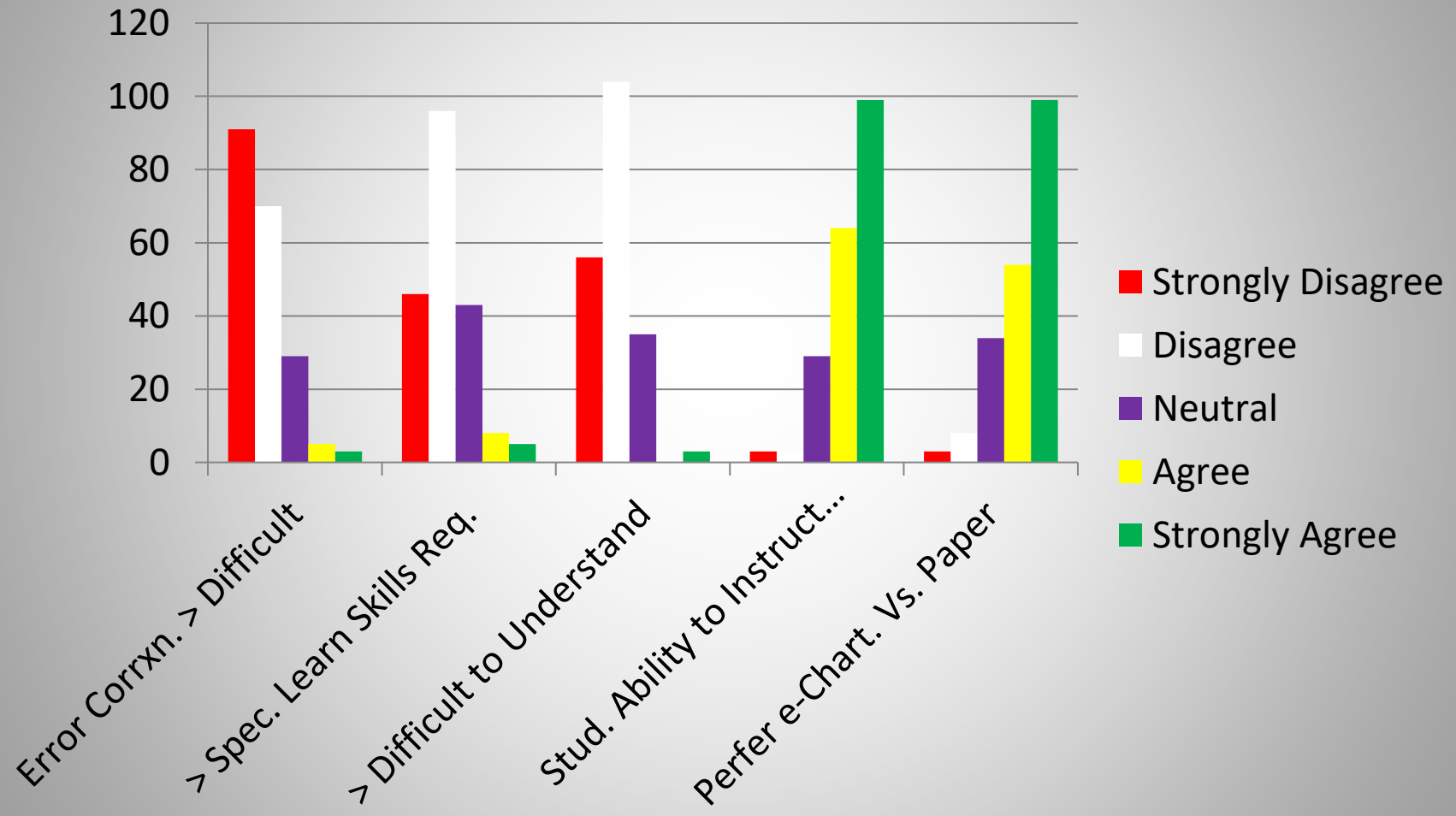
198 Respondents

e-CHARTING vs. PAPER



198 Respondents

e-CHARTING vs. PAPER



198 Respondents

Conclusions

- Feasibility was demonstrated at 100% within results of training/comparative efficacy of information obtained
- Facility and use of e-Charting format far outdistanced older, analog protocols while demonstrating statistically more accurate acquisition of DMFT, needed treatment, and existent oral health condition data
- Students clearly validated attitudinal preference for e-Charting over analog modalities while recognizing its benefits on all levels
- Undergraduate dental students can serve as valuable manpower in public oral health initiatives

Future Scope & Recommendations

- Refine / develop /publish curriculum for e-chart training of undergraduate dental students
- Enroll / train pan-Philippine Colleges of Dentistry
- Enlist the aid of salient stakeholders:
  - Local / national governments
  - Department of Education
  - Commission on Higher Education
  - Department of Health
  - National Institute of Health
  - NGO /Industry / Corporate underwriters
- Identify / Establish regional post-training pilot programs; begin to acquire, assemble, and extrapolate data
- Use the Philippines template for similar global initiatives wherever applicable

DentalCharting
Clinic Management

On Behalf of
The Republic of the Philippines

National University
National University College of Dentistry

DentalCharting Clinic Management

Our Deepest Thanks!