MYTHS IN ORTHODONTICS
I'M SCRATCHING MY HEAD, ARE THEY REALLY TRUE?

WHY DO THEY PERSIST?
OBSTACLES AND SOLUTIONS

Donald R. Oliver, DDS, MS
Associate Clinical Professor, Orthodontics
Saint Louis University
Objectives:

A. distinguish myth from controversy
B. describe how I came to the topic of myths
C. outline myths which I and others believe exist
D. identify obstacles to “myth-busting”
E. Suggest ways to myth-bust
A. distinguish myth from controversy

**MYTH:**
A WIDELY HELD BUT FALSE BELIEF OR IDEA

**CONTROVERSY:**
A DISAGREEMENT, TYPICALLY WHEN PROLONGED, PUBLIC AND HEATED
A good start in separating controversies from myths is to identify the myths.

MARTYN COBOURNE/ANDREW DI BIASE DO JUST THAT IN THEIR BOOK, JUST OUT....

Handbook of Orthodontics
Second Edition

There are 20 light blue boxes discussing controversies titled: WHERE'S THE EVIDENCE?
EVIDENCE IS OUR TOOL TO DISTINGUISH MYTH FROM CONTROVERSY

WHERE IS THE EVIDENCE? WHY IS IT SO HARD TO FIND?
1. IN OUR HIERARCHY OF EVIDENCE TOOL-BOX
   One of the BEST tools is the RCT and
   BUT RCT’S ARE VERY EXPENSIVE,
2. BETTER, META-ANALYSES AND SYSTEMATIC REVIEWS ...
BUT CURRENTLY THE UNDERLYING STUDIES ARE NOT EXCELLENT
20 SOMETHING % ARE EXCELLENT
20 SOMETHING % ARE POOR  REDUCING THEIR VALUE
WHILE WE HAVE COME A LONG WAY

FOR NOW THE EDGE OF MYTH AND CONTROVERSY IS BLURRED
ON THE SUBJECT OF EVIDENCE
HUANG, RICHMOND AND K. VIG
HAVE EDITED AN EXCELLENT TEXT
PUBLISHED BY WILEY-BLACKWELL 2011
I found that there were beliefs that some of our residents had that were different than my beliefs,..

A few…..

1. “Dr. Oliver, you cannot use headgears with American children. They simply won’t wear them.”

2. “We have heard of W-arches, we use Quad Helixes., they are better. That’s what we use!” RPEs more.

3. “RPE is great for gaining significant arch length (even with no posterior crossbites.)”

4. “The patient has a poor smile arc.” … and the list went on
B. describe how I came to the topic of myths

1. “Dr. Oliver, you cannot use headgears with American children. They simply won’t wear them.”

AMERICAN CHILDREN DO WEAR CPHGs. THEY HAVE BEEN SUCCESSFULLY RE-INTRODUCED INTO THE CLINIC

2. “We have heard of W-arches, BUT we use Quad Helixes., they are better. That’s what we use!” RPE even more.

THE QUAD SIMPLY ADDS 40-50 MM OF WIRE TO THE APPLIANCE SO ONE SHOULD DECIDE IF THEY NEED FORCE REDUCTION OR INCREASED RANGE THAT THE EXTRA WIRE PROVIDES
B. describe how I came to the topic of myths

“RPE is great for gaining significant arch length (no posterior crossbites.)”

3. (AT LEAST IN DEGREES OF MAGNITUDE)
   A. IF ONE CAN EXPAND THE LOWER ARCH 2-3 mm WITH STABILITY
   B. IF ONE GETS 0.7 mm ARCH LENGTH FOR EACH 1 mm OF EXPANSION
   C. ONE WILL GET 1.4 TO 2.1 mm OF ARCH LENGTH

IS THE GAIN WORTH THE BURDEN? … YOU DECIDE
B. describe how I came to the topic of myths

4. “The patient has a poor smile arc.” meaning that the orthodontist can or could have changed it!

SMILE ARC …IS DETERMINED MORE BY OCCLUSAL PLANE ANGLE AND CONVERSATION ANGLE THAN BY ANY OTHER ISSUES COMMONLY BELIEVED.

TO “BRACKET” TO IMPROVE SMILE ARC IS MINIMALLY HELPFUL, AS THE ISSUE IS VISUAL AND MORE ASSOCIATED WITH THE OCCLUSAL PLANE.
4. “The patient has a poor smile arc.” meaning that the orthodontist can or could have changed it significantly!

AS THE JAMES AND MARC ACKERMAN POINTED OUT, Smile analysis and design in the digital era. JCO 2002: 221-36

1. THE CANT OF THE OCCLUSAL PLANE
2. THE ANGLE OF THE VIEWER TO THE OCCLUSAL PLANE (CONVERSATIONAL OR PHOTOGRAPHIC)
3. ARCH FORM
4. INDIVIDUAL TOOTH POSITION are what counts
4. “The patient has a poor smile arc.” meaning that the orthodontist can or could have changed it significantly!

THE FIRST THREE HAVE THE MOST AFFECT AND ARE LARGELY OUTSIDE OF THE CONTROL OF THE ORTHODONTIST

WITH INDIVIDUAL TOOTH POSITION HAVING THE LEAST AFFECT, YET WE HAVE PEOPLE PUSHING FOR STRANGE BRACKET HEIGHTS
B. describe how I came to the topic of myths

THESE ARE BUT FOUR EXAMPLES OF MYTHS THAT I FOUND

1. Where did these teachings come from come from ?
2. Why are they still being taught ?
3. Why are they so hard to “bust” ?
4. Was I the only one with this experience ?
C. outline some myths which I and others believe exist

First the process

So I mailed 140 questionnaires to educators requesting one or two myths.

I received 40 replies by mail, internet, phone, and personal communication.

Totaling 75 suggestions, mostly myths, (No evidence to support, or strong evidence against)

Some were controversies (ie. mixed evidence)
C. outline some myths which I found

1. “Dr. Oliver, you cannot use headgears with American children. They simply won’t wear them.”
2. “We have heard of W-arches, we use Quad Helixes, they are better. That’s what we use” “RPEs more !”
3. “RPE is great for gaining significant arch length (no posterior crossbites.)”
4. “The patient has a poor smile arc.”
5. The contribution of leveling of the Curve of Spee was in excess of what I thought.
6. Functionals grow mandibles
7. Mini-screw implants should be placed perpendicularly to the bone surface (orthogonally)
8. The MEAW technique intrudes posterior teeth
9. CPHG opens the mandibular plane angle, “wedge effect.” … extractions will aid in closing

10. Extractions (including two premolar ext) flatten faces

11. Four premolar extractions flatten faces

12. Open eruption of PDCs is the “only (best)way to retrieve PDCs”

13. “Dr. Oliver if we lace the posterior teeth together, can’t we retract the canines with no loss of anchorage?”

14. Teeth must be over basal bone

15. Proclination of incisors insures periodontal breakdown and is unstable

16. Invisalign® should not be taught

17. RPE should be rapid, and not Intermediate or slow.

Oliver 17
18. Bio-progressive VTO
19. Self-ligating brackets, treatment efficiency, better hygiene, biomechanical benefits
20. Growth and development: unilateral crossbites and asymmetrical jaw growth
21. Unlocking the bite
22. Orthodontists as dentofacial orthopedists
23. “Maxilla is the wrong jaw to treat”
24. Orthopedically modifying the lower jaw
25. CVM/HW/Stature best for predicting pubertal growth spurt
26. RPE Helpful in protraction face mask by loosening the sutures
27. New archwires grow maxilllas and the results are stable
28. New brackets eliminate need for RPE and/or extraction
29. Mandibular expansion is orthopedic

To these were added those from the educators
30. There is a best time to treat a patient

31. Bite plates, versus AW sweeps versus intrusion arches produce different results

32. Intrusion of upper molars in high MP angle patients gives true mandibular rotation

33. Maintenance of lower canine width gives stability of the lower canine…and expansion does not.

34. Tongue thrust swallowing produces open bites

35. Airway obstruction causes open-bites

36. Extraction in open bites leads to gumminess

37. Serial extraction is more foe than friend

38. Nance holding arch provides anchorage

39. Occlusion/malocclusion cause/cure TMJ

40. Orthodontists should determine the need for third molar removal

To these were added those from the educators
41. patients don’t “mind braces.”
42. preserving leeway space does not reduce the need for extractions
43. Wilkodontics is not evidence based
44. Canine retraction preserves anchorage over en masse of the six anterior teeth
45. Orthodontics stretches supracrestal fibers leading to relapse
46. 8/8s cause crowding
47. Treating to race or ethnicity
48. Functionals move jaws without moving teeth or the alveolus
49. Mandibular growth can be restrained
50. Clear aligners can only tip teeth
51. Lateral bone growth from archwires
52. Tooth movement accelerated by vibration
53. Growing bone from orthodontic appliances
54. Anchorage improved with anchorage preparation arches

(37 additional “myths”) 54 total

To these were added those from the educators
THIS WAS NOT A VOTE
BUT AN IDENTIFICATION OF LIKELY SUSPECTS

BASED ON EDUCATORS’ UNDERSTANDING OF THE LITERATURE
THE EDUCATORS TOP FOUR MENTIONED ORTHODONTIC MYTHS

1. PROCLINATION OF LOWER INCISORS AS A FACTOR FOR RECESSION OR STABILITY (9 MENTIONS)
2. LOWER THIRDS CAUSE CROWDING (6)
3. ORTHODONTISTS ARE DENTOFACIAL ORTHOPEDISTS (5)
4. NEW ARCHWIRE SYSTEMS CAN EXPAND W/O RELAPSE (4)

The remaining 50 “myths seen above were mentioned once or twice
OBSTACLES TO MYTH-BUSTING

YOGI BERRA WHO GREW UP ON ST. LOUIS’ “ITALIAN HILL” SAID:

“Baseball is 50% physical, the other 90% is mental”

AS IT IS WITH BASEBALL, SO IT IS WITH ORTHODONTICS,

BUSTING MYTHS, FINDING THE EVIDENCE … takes a lot of hard work and resources

50% physical and the other 90% mental

D. identify obstacles to “myth-busting”
IDENTIFICATION AND ILLUSTRATION OF TEN OBSTACLES

1. TRADITION AND ORTHODOXY

EXAMPLE: TEETH OVER BASAL BONE

CHARLES BURSTONE AND MICHAEL MARCOTTE FOUND THE NEBULOUS CONCEPT OF TEETH OVER BASAL BONE A MYTH,

WHEN 3 STANDARD DEVIATIONS OF GOOD FACES AND STABLE OCCLUSIONS SHOW A HUGE RANGE (33°) AND GOOD PERIODONTAL HEALTH

D. identify obstacles to “myth-busting”
1. TRADITION AND ORTHODOXOY

“TEETH OVER BASAL BONE IS MINIMALLY HELPFUL…”

D. identify obstacles to “myth-busting”
D. identify obstacles to “myth-busting”

1. TRADITION AND ORTHODOXY

EXAMPLE:

MOST STUDY GROUPS, OF COURSE, HAVE MADE HUGE CONTRIBUTIONS TO THE ART AND SCIENCE OF ORTHODONTICS

SOME STUDY CLUBS, PRACTICE MANAGEMENT GROUPS AND OTHER AFFINITY GROUPS, HOWEVER, CAN TAKE ON AN ALMOST CULT STATUS, Ie members are reticent to take a different view from the group

MAKING SOME MYTHICAL TRADITIONS AND ORTHODOXIES DIFFICULT TO CHANGE
2. PREMATURE COGNITIVE COMMITMENT

HARVARD PSYCHOLOGIST, ELLEN LANGER, PhD

AS CHILDREN

THE “FIRST STEP TOWARD INTELLECTUAL MASTERY OF THE WORLD … IS THE DISCOVERY OF GENERAL PRINCIPLES, RULES AND LAWS WHICH BRING ORDER TO CHAOS.

D. identify obstacles to “myth-busting”
2. PREMATURE COGNITIVE COMMITMENT

“WE SIMPLIFY THE WORLD OF PHENOMANA, BUT WE CAN NOT AVOID FALSIFYING IT IN DOING SO…”

AS ADULTS WE OFTEN DO THIS WHEN WE ENCOUNTER SOMETHING NEW

D. identify obstacles to “myth-busting”
2. PREMATURE COGNITIVE COMMITMENT

THE NEW RESIDENT BRINGS WITH HIM/HER CONCEPTS FROM DENTAL SCHOOL THAT MAY NOT APPLY DIRECTLY TO THE SCIENCE OF ORTHODONTICS... CALLED PREMATURE COGNITIVE COMMITMENTS:

D. identify obstacles to "myth-busting"
2. PREMATURE COGNITIVE COMMITMENT

EXAMPLES:  A. CERTAIN GNATHOLOGICAL CONCEPTS

B. THE IDEA THAT THIRD MOLARS CAUSE CROWDING / AND/OR THAT THEIR REMOVAL IS THE ORTHODONTIST’S “CALL”

C. NEW TECHNIQUES, APPLIANCES AND MATERIALS ADOPTED BY RESIDENTS AND ORTHODONTISTS ALIKE WITHOUT KNOWLEDGE, TIME OR EXPERIENCE TO ADEQUATELY EVALUATE PRIOR TO ADOPTION

D. identify obstacles to “myth-busting”
2. PREMATURE COGNITIVE COMMITMENT

“WE TEND TO CLING TO THESE RULES AND CATEGORIES WE CONSTRUCT FROM THEM IN A MINDLESS MANNER.”

REPITITION, PRACTICE AND A MORE POWERFUL EFFECT THAT PSYCHOLOGISTS CALL

PREMATURE COGNITIVE COMMITMENT

D. identify obstacles to “myth-busting”
2. PREMATURE COGNITIVE COMMITMENT

ONE OF THE GREATEST OBSTACLES FOR US AS TEACHERS AND AS STUDENTS AND PRACTITIONERS ALIKE TO OVERCOME

TELL ME 3 TIMES AND IT MUST BE TRUE

D. identify obstacles to “myth-busting”
D. identify obstacles to "myth-busting"

EXAMPLE: LIKE THE GAME OF TELEPHONE OR CHINESE WHISPERS
3. INTERNAL CLONING

EXAMPLE:

INTERNAL CLONING IS THE REPETITION IN TEXTBOOKS AND JOURNAL LITERATURE WHEREBY AUTHORS DO NOT CRITICALLY EVALUATE THEIR SOURCES AND REPEAT ERRORS and ERRORS OF CONTEXT,

STEPHEN JAY GOULD, (1941-2002), HARVARD PALEONTOLOGIST, BROUGHT US THE TERM

D. identify obstacles to “myth-busting”
Scientific investigations yield only probability statements and not absolute facts. And yet, these probabilistic data and information that are true under certain circumstances are presented in textbooks as though they were certain and context-free.

LANGER in pointing to Gould’s concerns about “INTERNAL CLONING.”

D. identify obstacles to “myth-busting”
3. INTERNAL CLONING

EXAMPLE:

AN EXAMPLE OF ERROR OF CONTEXT WOULD BE AN EXCELLENT PIECE OF RESEARCH, BY PICKARD, DECHOW, ROUSSOW AND BUSCHANG AJODO 2010 JAN 137 (1) 91-9

USING 9 CADAVER (DEAD) MANDIBLES UTILIZING FORCE LOADS OF 10 TIMES CLINICAL LOADING (ie. 8700 gms TO 34,000 gms) ON SCREWS (MSIs) PLACED AT 45°, 90° 135° TO THE BONE SURFACE

D. identify obstacles to “myth-busting”
3. INTERNAL CLONING

NOT DIRECTLY APPLICABLE TO OUR CLINICAL SITUATION … CADAVERS TO LIVE HUMANS… 10 X FORCE LOADS … WHOLLY DIFFERENT CONTEXTS

D. identify obstacles to “myth-busting”
D. identify obstacles to “myth-busting”

3. INTERNAL CLONING

IN AN OTHERWISE EXCELLENT REFERENCE GUIDE
BY DENTAURUM AND SEBASTIAN BAUMGAERTEL

DESPITE THE ILLUSTRATION BASED UPON ERROR OF CONTEXT.
D. identify obstacles to “myth-busting”

3. INTERNAL CLONING

THE CONCEPT WAS CARRIED TO ANOTHER PUBLICATION AS AN “ERROR OF CONTEXT”

(PHOTO AF ANGLES OF TEETH)
4. CAREER ENHANCEMENT BY THE LECTURER/AUTHOR

EXEMPLARY:

LECTURING AND PUBLISHING

A. OVERSTATING THE VALUE OF A PROCEDURE
B. CHERRY PICKING ILLUSTRATIVE “CASES”
C. NOT INCLUDING POST-TREATMENT CEPHALOMETRICS
D. SHOWING SOMETHING OUTRAGEOUS, AS A SHOWMAN

D. identify obstacles to “myth-busting”
D. identify obstacles to “myth-busting”
4. CARRIER ENHANCEMENT BY THE LECTURER/AUTHOR

EXAMPLE: PUBLISH OR PERISH

WITH MORE THAN 1 MILLION PAPERS IN BIOSCIENCE PUBLISHED (2015)...
WITH A GROWING NUMBER OF RETRACTIONS ...
LEADING SOME TO CONCLUDE THAT:

MANY RESULTS MAY NOT BE REPRODUCIBLE

....JEFFREY S FLIER, DEAN OF HARVARD MEDICAL SCHOOL
IN THE MARCH 2,2016 WALL STREET JOURNAL

D. identify obstacles to “myth-busting”
4. CARRIER ENHANCEMENT BY THE LECTURER/AUTHOR

EXAMPLE: PUBLISH OR PERISH

SPRINGER ALONE, ONE OF THE LARGEST RETRACTED 64 ARTICLES IN AUGUST 2015

NO WONDER WITH STORIES LIKE THAT OF GALADRIEL MILKWOOD …

D. identify obstacles to “myth-busting”
D. identify obstacles to "myth-busting"
4. CAREER ENHANCEMENT BY THE LECTURER/AUTHOR

GALADRIEL MILKWOOD WAS A JOKE, THE AUTHOR’S DOG SHOWS THE PRESSURE ON PUBLISHERS AND PEER REVIEWERS TO CATCH ERRORS …HERE THE RIDICULOUS OF COURSE …

& THERE HAS BEEN A SPIKE IN PAPERS & NUMBERS OF AUTHORS FOR MANY REASONS, ONE OF WHICH IS CAREER ENHANCEMENT

D. identify obstacles to “myth-busting”
D. identify obstacles to “myth-busting”

4. CAREER ENHANCEMENT BY THE LECTURER/AUTHOR

ANOTHER EXAMPLE: From the same article in the WSJ, August 10, 2005, Robert Lee Hotz

GEORGES AAD A FRENCH PHYSICIST WORKING WITH THE LARGE HADRON COLLIDER IN SWITZERLAND WHO HAS PUBLISHED 458 PAPERS, AND ON ONE ARTICLE WAS ONE OF 5154 AUTHORS TO SIGN ON … BEING AAD, HIS NAME IS ALWAYS FIRST, (FIRST IS GENERALLY RESERVED FOR THE PRINCIPLE RESEARCHER)
4. CARRIER ENHANCEMENT BY THE LECTURER/AUTHOR

*LANCET* in 1998 retracted the now famous report that linked autism with a vaccine

D. identify obstacles to "myth-busting"
D. identify obstacles to “myth-busting”

4. CARRIER ENHANCEMENT BY THE LECTURER/AUTHOR

PUBLISH OR PERISH

THESE RETRACTIONS ARE MORE FROM ERROR THAN FRAUD …AND STEM FROM

1. DESIGN ERRORS AND STATISTICAL ERRORS,
2. CAREER AND FINANCIAL INCENTIVES
3. A FAILURE OF JOURNALS IN KNOWING HOW TO PRESENT

Wall Street Journal, Wed, March 2, 2016 …Jeffrey S. Flier

NONETHELESS THE DAMAGE IS OFTEN ALREADY DONE
EXAMPLE: CHARISMA OF THE SPEAKER

WE EACH REALIZE THE VALUE OF EXCELLENT COMMUNICATION, AND THE FACT THAT IN ALL WALKS OF LIFE THE CHARISMATIC PERSON CAN BE MORE CONVINCING

WHILE MUCH OF WHAT IS PRESENTED IS LIKELY TRUE
THE LISTENER OFTEN ACCEPTS EVERYTHING PRESENTED AS TRUE

D. identify obstacles to “myth-busting”
4. CARRIER ENHANCEMENT BY THE LECTURER/AUTHOR

EXAMPLE: DIFFERENTIATION FROM OTHERS

BOTH SPEAKERS AND VENDORS ARE OFTEN TRYING TO DIFFERENTIATE THEIR “PRODUCTS.”

D. identify obstacles to “myth-busting”
4. CARRIER ENHANCEMENT BY THE LECTURER/AUTHOR

EXAMPLE: DIFFERENTIATION FROM OTHERS

WHETHER IN POLITICS, ORTHODONTIC APPLIANCES OR CAREER … A SALES TACTIC IS DIFFERENTIATION AND THE DIFFERENCES MAY BE LITTLE OR SUBSTANTIAL

BUT DIFFERENTIALTION IS THE NAME OF THE GAME

D. identify obstacles to “myth-busting”
D. Identify obstacles to "myth-busting"

5. Vendor Influence

Example:

Our vendors, manufacturers, distributors and sales-people are so important to us ... as evidenced by their support for this and other meetings.

We know this

And we tip our hat

Thank you, thank you, thank you
5. VENDOR INFLUENCE

EXAMPLE: OUR VENDORS, MANUFACTURERS, DISTRIBUTORS AND SALES-PEOPLE ARE SO IMPORTANT TO US …

BUT AT THE SAME TIME WE MUST UNDERSTAND THE NEED FOR INDEPENDENCE AND SEPARATION IN PRESENTING THE EVIDENCE?
D. identify obstacles to “myth-busting”

6. COMPLEXITY OF BIOMECHANICS

EXAMPLE: THE WHOLE REALM, AND ALL OF THE COMPONENTS

BIOMATERIALS, BIOMECHANICS ARE TOUGH...
A NUMBER OF EDUCATORS POINTED TOWARD FRICITION, AND
LACK OF UNDERSTANDING OF SE NiTi AND HANT (heat activated NiTi) WIRES
AS SPECIFIC PROBLEMS
D. identify obstacles to “myth-busting”

EXAMPLE: WE ALL HAVE OUR BIASES, BUT AS WE LISTEN OR READ WE MAY NOT BE AWARE WHO IS THE MOST HANDSOME OF THESE THREE YOUNG MEN?
D. identify obstacles to "myth-busting"

**Example:**
We all have our biases, but as we listen or read we may not be aware.

Brad Pitt on the left, our son John Oliver on the right.

But of course, I am biased.

From their college days at the University of Missouri.
D. identify obstacles to “myth-busting”

EXAMPLE:

EFFICIENCY, MARKETING, MONEY MAY INTERFERE WITH PATIENTS’ BEST INTEREST OR THE TRUTH

Per veritatem, vis
Through truth, strength

Washington University (StL)

A CERTAIN AMOUNT OF PUFF IS OK IN PRODUCT SALES, MUCH LESS SO IN PROFESSIONAL CARE
9. THE STATUS OF (DENTAL) EDUCATION

EXAMPLE: RESOURCES – NOT-FOR-PROFIT DENTAL EDUCATION HAS BEEN RESOURCE-POOR ...AS DENTAL SCHOOLS

1. FEW HUGE GIFTS WHEN COMPARED TO MEDICAL SCHOOLS
2. TRAINING IS VERY EXPENSIVE
3. LOW LEVELS OF CLINIC INCOME COMPARED TO GRADUATE SPECIALTIES
4. HIGH LEVEL OF TEACHER/STUDENT CONTACT WITH LITTLE TIME FOR RESEARCH ACTIVITY
5. FEW GRANTS

D. identify obstacles to “myth-busting”
D. identify obstacles to “myth-busting”

EXAMPLE: MANY OF THE 54 MYTHS HAVE EXISTED FOR DECADES

IS THERE AN INTEREST IN “MYTH BUSTING” VERSUS PURSUING NEW AVENUES? AFTER ALL IT IS MORE EXCITING TO DESIGN A NEW CAR THAN TO REPAIR A WRECKED ONE

10. IS THERE A WILL?
SO HOW DO WE MYTH-BUST?

E. Suggest ways to myth-bust
1. RESIST TRADITION AND ORTHODOXY

BE OPEN TO NEW IDEAS,

WE CAN UNDERSTAND THAT WE DO NOT TREAT TO “NORMS.”

E. Suggest ways to myth-bust
2. BE MINDFUL NOT MINDLESS

- REALIZE THAT RULES AND LAWS WE LEARNED EARLY, MAY HAVE MADE ORDER OUT OF CHAOS BUT WE NEED TO CONSTANTLY REEXAMINE OUR BELIEFS

- BE AWARE OF PREMATURE COGNITIVE COMMITMENTS

E. Suggest ways to myth-bust
E. Suggest ways to myth-bust

THIKING OUT OF THE BOX LIKE ZIA CHISHTI DID WHEN HE FOUNDED ALIGN TECHNOLOGY AT STANFORD

Imagination is more important than knowledge

Simon and Shuster, NY, 2007
“SKEPTICAL SCRUTINY IS THE MEANS, ...BY WHICH DEEP THOUGHTS ARE WINNOWED FROM DEEP NONSENSE”

Sagan from Brainyquotes.com

CARL SAGAN (1932-96)
ONE OF OUR MOST IMAGINATIVE SCIENTISTS AND BEST TEACHERS

E. Suggest ways to myth-bust
4. INCREASE OUR VISION THROUGH PRACTICE

CANDIDATE FOR US PRES
NEW JERSEY SENATOR
NY KNICKS STAR
OLYMPIC GOLD MEDAL
WINNER
RHODES SCHOLAR
PRINCETON BB STAR
CRYSTAL CITY, MO

SENATOR BRADLEY IMPROVED HIS PERIPHERAL VISION BY TRYING TO IDENTIFY OBJECTS IN THE STORE WINDOWS AS HE WALKED DOWN THE STREET IN HIS HOME TOWN OF CRYSTAL CITY, MISSOURI

E. Suggest ways to myth-bust
5. BE CREATIVE TO IMPROVE OUR VISION

RATHER BAZAAR, THE DUKE OF URBINO IN RENAISSANCE ITALY IMPROVED HIS PERIPHERAL VISION TO THE RIGHT BY HAVING THE BRIDGE OF HIS NOSE CUT OFF.

HE LOST HIS RIGHT EYE IN BATTLE AND FEARED ASSASSINATION IF HE DID NOT HAVE GOOD VISION TO HIS RIGHT.

By early renaissance artist Piero della Francesca

E. Suggest ways to myth-bust
6. BE CAREFUL, KNOW WHERE YOU ARE GOING

You've got to be careful
If you don't know where you are going, because you might not get there.   Yogi

Credit: Courtesy of Yogi's niece and Chris Millaway

E. Suggest ways to myth-bust
7. Myth-busting takes human and other resources

As Lysle Johnston likes to remind us, support your school and support the AAOF.

E. Suggest ways to myth-bust
7. MYTH-BUSTING TAKES HUMAN AND OTHER RESOURCES

IN NORTH AMERICA AND ELSEWHERE WE ARE LIMITED BY THE

1. NUMBER OF EDUCATORS,
2. NUMBER WITH RESEARCH CREDENTIALS UNTIL RELATIVELY RECENTLY
3. THEIR AVAILABLE RESEARCH TIME
4. LIMITED BASIC SCIENCE FACULTY COLLEAGUES WITH WHOM TO COLLABORATE
5. LIMITATION OF THE SCOPE OF MASTERS RESEARCH ETC.

E. Suggest ways to myth-bust
WE DO HAVE A LARGE NUMBER OF RESIDENTS WORKING ON THEIR MASTERS DEGREES. OVER 300 EACH YEAR.

MANY SEEN AMONG THOSE AT THE RECENT GORP PROGRAM, ST. Louis 2015
Graduate Orthodontic Residents Program

PERHAPS THEY COULD FOCUS ON MYTHS IN THEIR RESEARCH

E. Suggest ways to myth-bust
7. MYTH-BUSTING TAKES HUMAN AND OTHER RESOURCES

E. Suggest ways to myth-bust

"What a great bunch of kids I am with!"
Says Buzz

Graduate Orthodontic Residents Program (GORP) in St. Louis, 2015

Credit: Cover December 2015 AJODO
Elsevier Publishing
7. MYTH-BUSTING TAKES HUMAN AND OTHER RESOURCES

THE AAOF HAS FUNDED NEARLY $11 Million IN RESEARCH TO DATE
with $745,000 budgeted for 2016
and in addition
established and funded four named funds honoring
Robert Boyd, Charles Burstone, Fred Garrett & James McNamara
with pledged amounts of $250,000 each ($1 M total)

E. Suggest ways to myth-bust
ORTHODONTICS IS MY PASSION...

“That’s why I support the AAOF.”
8. “KNOW WHEN TO HOLD ‘EM, KNOW WHEN TO FOLD ‘EM”

So..

“If you’re gonna play the game, boy
You gonna learn to play it right
You got to know when to hold’em
Know when to fold’em”

Performer KENNY ROGERS (1978)...
Written by Don Schlitz (1976),
in the lyrics to the “THE GAMBLER”

E. Suggest ways to myth-bust