

Clinical Study

Quickwhite

LumaChem, Utah

8050 South 1300 West, West Jordan, Utah 84088, USA

Value Changes for Patients

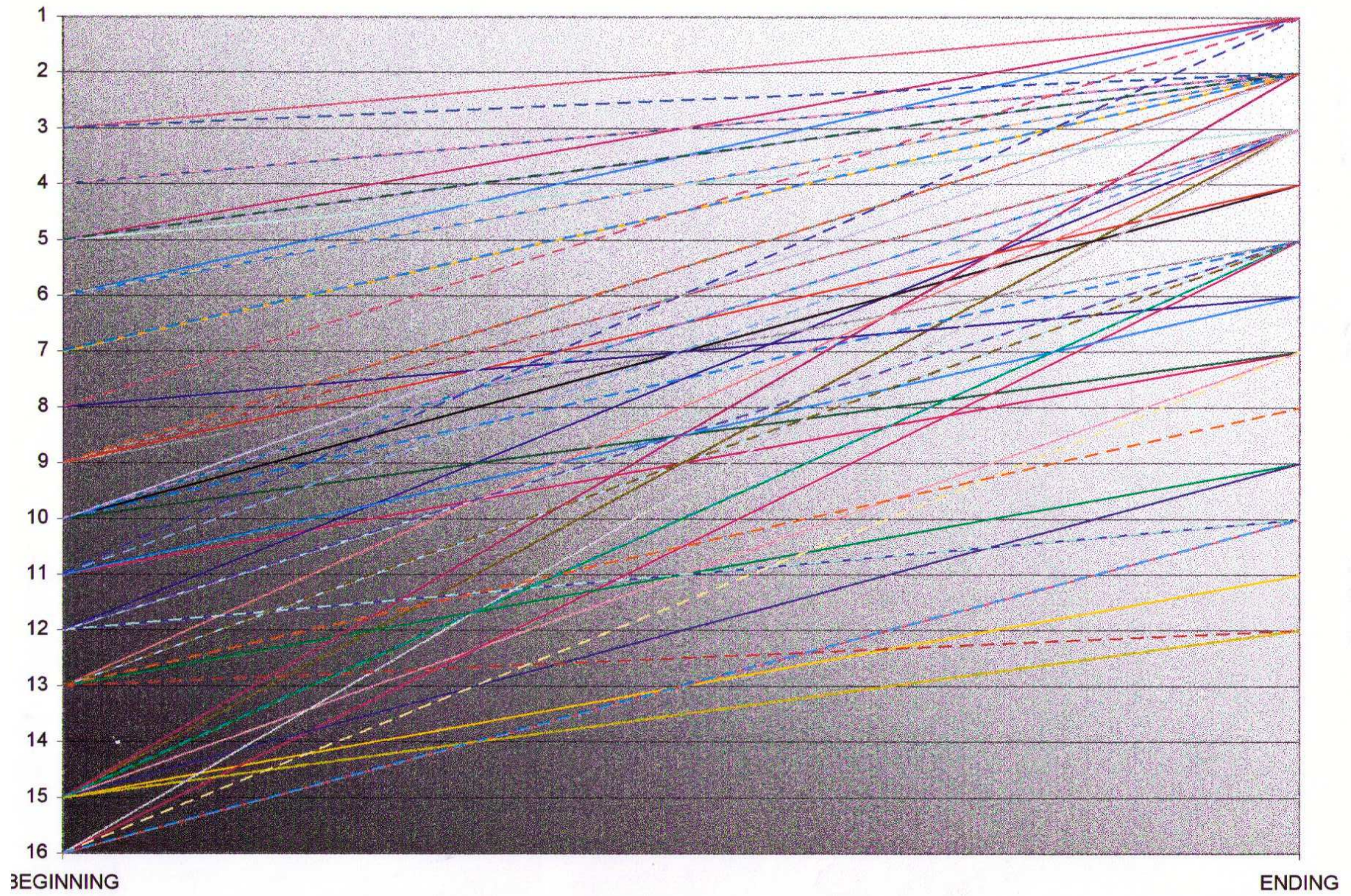
ALL PATIENTS

| PATIENT/TOOTH | BEGINNING SHADE | ENDING SHADE | BEGINNING VALUE | ENDING VALUE | VALUE CHANGE |
|---------------|-----------------|--------------|-----------------|--------------|--------------|
| BM | B3 | C2 | 11 | 7 | 4 |
| EC/1 | A4 | A2 | 15 | 5 | 10 |
| EC/2 | C1 | B1 | 6 | 1 | 5 |
| SS/1 | B4 | A3 | 13 | 9 | 4 |
| SS/2 | A3 | B2 | 9 | 3 | 6 |
| SS/3 | A3.5 | B2 | 12 | 3 | 9 |
| MR/1 | A3.5 | B2 | 12 | 3 | 9 |
| MR/2 | C1 | A1 | 6 | 2 | 4 |
| RB/1 | B4 | A2 | 13 | 5 | 8 |
| RB/2 | A2 | B2 | 5 | 3 | 2 |
| RB/3 | A2 | A1 | 5 | 2 | 3 |
| RB/4 | A2 | B1 | 5 | 1 | 4 |
| BL/1 | A4 | C2 | 15 | 7 | 8 |
| BL/2 | A4 | A3 | 15 | 9 | 6 |
| BL/3 | D3 | C2 | 10 | 7 | 3 |
| MU/1 | A3.5 | D3 | 12 | 10 | 2 |
| MU/2 | B4 | A3 | 13 | 9 | 4 |
| M/1 | A2 | A1 | 5 | 2 | 3 |
| M/2 | C2 | A1 | 7 | 2 | 5 |
| M/3 | A3 | A2 | 9 | 5 | 4 |
| KP/1 | A3 | D2 | 9 | 4 | 5 |
| KP/2 | D3 | D2 | 10 | 4 | 6 |
| KP/3 | A3 | A2 | 9 | 5 | 4 |
| KM/1 | D2 | A1 | 4 | 2 | 2 |
| KM/2 | A2 | A1 | 5 | 2 | 3 |
| BL/1 | D3 | C2 | 10 | 7 | 3 |
| BL/2 | A4 | B2 | 15 | 3 | 12 |
| BL/3 | A4 | A3 | 15 | 9 | 6 |
| DB/1 | B2 | B1 | 3 | 1 | 2 |
| DB/2 | A2 | A1 | 5 | 2 | 3 |
| K/1 | D3 | D2 | 10 | 4 | 6 |
| K/2 | A3.5 | A2 | 12 | 5 | 7 |
| K/3 | A3 | D2 | 9 | 4 | 5 |
| EG/1 | A4 | A2 | 15 | 5 | 10 |
| EG/2 | D4 | C1 | 8 | 6 | 2 |
| EG/3 | A4 | B3 | 15 | 11 | 4 |
| KE | C4 | A2 | 16 | 5 | 11 |
| JG | B3 | C1 | 11 | 6 | 5 |
| MB | A2 | A1 | 5 | 2 | 3 |
| LG/1 | B4 | A3 | 13 | 9 | 4 |
| LG/2 | A4 | A3 | 15 | 9 | 6 |
| LG/3 | A4 | A3.5 | 15 | 12 | 3 |
| RR | A2 | B1 | 5 | 1 | 4 |
| BB/1 | D3 | B2 | 10 | 3 | 7 |
| BB/2 | C4 | B2 | 16 | 3 | 13 |
| KB/1 | A3 | A1 | 9 | 2 | 7 |
| KB/2 | A2 | A1 | 5 | 2 | 3 |
| TB/1 | C4 | D3 | 16 | 10 | 6 |
| TB/2 | A3.5 | A2 | 12 | 5 | 7 |
| SA | A3.5 | A2 | 12 | 5 | 7 |
| DB | A4 | A1 | 15 | 2 | 13 |
| CM/1 | B4 | B2 | 13 | 3 | 10 |
| CM/2 | D3 | A1 | 10 | 2 | 8 |
| NT/1 | D3 | A1 | 10 | 2 | 8 |

Value Changes for Patients

| | | | | | |
|--------------|-----------|------|-------------|------------|------------|
| NT/2 | B4 | A2 | 13 | 5 | 8 |
| YS/1 | C4 | D3 | 16 | 10 | 6 |
| YS/2 | C2 | A1 | 7 | 2 | 5 |
| YS/3 | C2 | A1 | 7 | 2 | 5 |
| BC/1 | A4 | A2 | 15 | 5 | 10 |
| BC/2 | B4 | A3.5 | 13 | 12 | 1 |
| CP | D3 | B2 | 10 | 3 | 7 |
| CD/1 | D3 | B2 | 10 | 3 | 7 |
| CD/2 | D3 | A2 | 10 | 5 | 5 |
| JB/1 | A3.5 | A2 | 12 | 5 | 7 |
| JB/2 | A3.5 | D3 | 12 | 10 | 2 |
| CM | C4 | C2 | 16 | 7 | 9 |
| MJ/1 | B3 | B2 | 11 | 3 | 8 |
| MJ/2 | D2 | A1 | 4 | 2 | 2 |
| ML/1 | D3 | B2 | 10 | 3 | 7 |
| ML/2 | C1 | A1 | 6 | 2 | 4 |
| ML/3 | B3 | B1 | 11 | 1 | 10 |
| KC/1 | C4 | D3 | 16 | 10 | 6 |
| KC/2 | A4 | A3.5 | 15 | 12 | 3 |
| KW/1 | B4 | A2 | 13 | 5 | 8 |
| KW/2 | A3.5 | A2 | 12 | 5 | 7 |
| KW/3 | B4 | D4 | 13 | 8 | 5 |
| MN/1 | A2 | A1 | 5 | 2 | 3 |
| MN/2 | A3 | B2 | 9 | 3 | 6 |
| AC/1 | B2 | A1 | 3 | 2 | 1 |
| AC/2 | A4 | A2 | 15 | 5 | 10 |
| MM/1 | A2 | A1 | 5 | 2 | 3 |
| MM/2 | B4 | A2 | 13 | 5 | 8 |
| RR | A3 | A1 | 9 | 2 | 7 |
| KC | D4 | B1 | 8 | 1 | 7 |
| V | A3.5 | A2 | 12 | 5 | 7 |
| COUNT | 87 | | 10.5 | 4.7 | 5.8 |

5.788235294



Value Changes for Patients

A Shades Only

ALL PATIENTS

| PATIENT/TOOTH | BEGINNING SHADE | ENDING SHADE | BEGINNING VALUE | ENDING VALUE | VALUE CHANGE |
|---------------|-----------------|--------------|-----------------|--------------|--------------|
| EC/1 | A4 | A2 | 15 | 5 | 10 |
| SS/2 | A3 | B2 | 9 | 3 | 6 |
| SS/3 | A3.5 | B2 | 12 | 3 | 9 |
| MR/1 | A3.5 | B2 | 12 | 3 | 9 |
| RB/2 | A2 | B2 | 5 | 3 | 2 |
| RB/3 | A2 | A1 | 5 | 2 | 3 |
| RB/4 | A2 | B1 | 5 | 1 | 4 |
| BL/1 | A4 | C2 | 15 | 7 | 8 |
| BL/2 | A4 | A3 | 15 | 9 | 6 |
| MU/1 | A3.5 | D3 | 12 | 10 | 2 |
| M/1 | A2 | A1 | 5 | 2 | 3 |
| M/3 | A3 | A2 | 9 | 5 | 4 |
| KP/1 | A3 | D2 | 9 | 4 | 5 |
| KP/3 | A3 | A2 | 9 | 5 | 4 |
| KM/2 | A2 | A1 | 5 | 2 | 3 |
| BL/2 | A4 | B2 | 15 | 3 | 12 |
| BL/3 | A4 | A3 | 15 | 9 | 6 |
| DB/2 | A2 | A1 | 5 | 2 | 3 |
| K/2 | A3.5 | A2 | 12 | 5 | 7 |
| K/3 | A3 | D2 | 9 | 4 | 5 |
| EG/1 | A4 | A2 | 15 | 5 | 10 |
| EG/3 | A4 | B3 | 15 | 11 | 4 |
| MB | A2 | A1 | 5 | 2 | 3 |
| LG/2 | A4 | A3 | 15 | 9 | 6 |
| LG/3 | A4 | A3.5 | 15 | 12 | 3 |
| RR | A2 | B1 | 5 | 1 | 4 |
| KB/1 | A3 | A1 | 9 | 2 | 7 |
| KB/2 | A2 | A1 | 5 | 2 | 3 |
| TB/2 | A3.5 | A2 | 12 | 5 | 7 |
| SA | A3.5 | A2 | 12 | 5 | 7 |
| DB | A4 | A1 | 15 | 2 | 13 |
| BC/1 | A4 | A2 | 15 | 5 | 10 |
| JB/1 | A3.5 | A2 | 12 | 5 | 7 |
| JB/2 | A3.5 | D3 | 12 | 10 | 2 |
| KC/2 | A4 | A3.5 | 15 | 12 | 3 |
| KW/2 | A3.5 | A2 | 12 | 5 | 7 |
| MN/1 | A2 | A1 | 5 | 2 | 3 |
| MN/2 | A3 | B2 | 9 | 3 | 6 |
| AC/2 | A4 | A2 | 15 | 5 | 10 |
| MM/1 | A2 | A1 | 5 | 2 | 3 |
| RR | A3 | A1 | 9 | 2 | 7 |
| V | A3.5 | A2 | 12 | 5 | 7 |

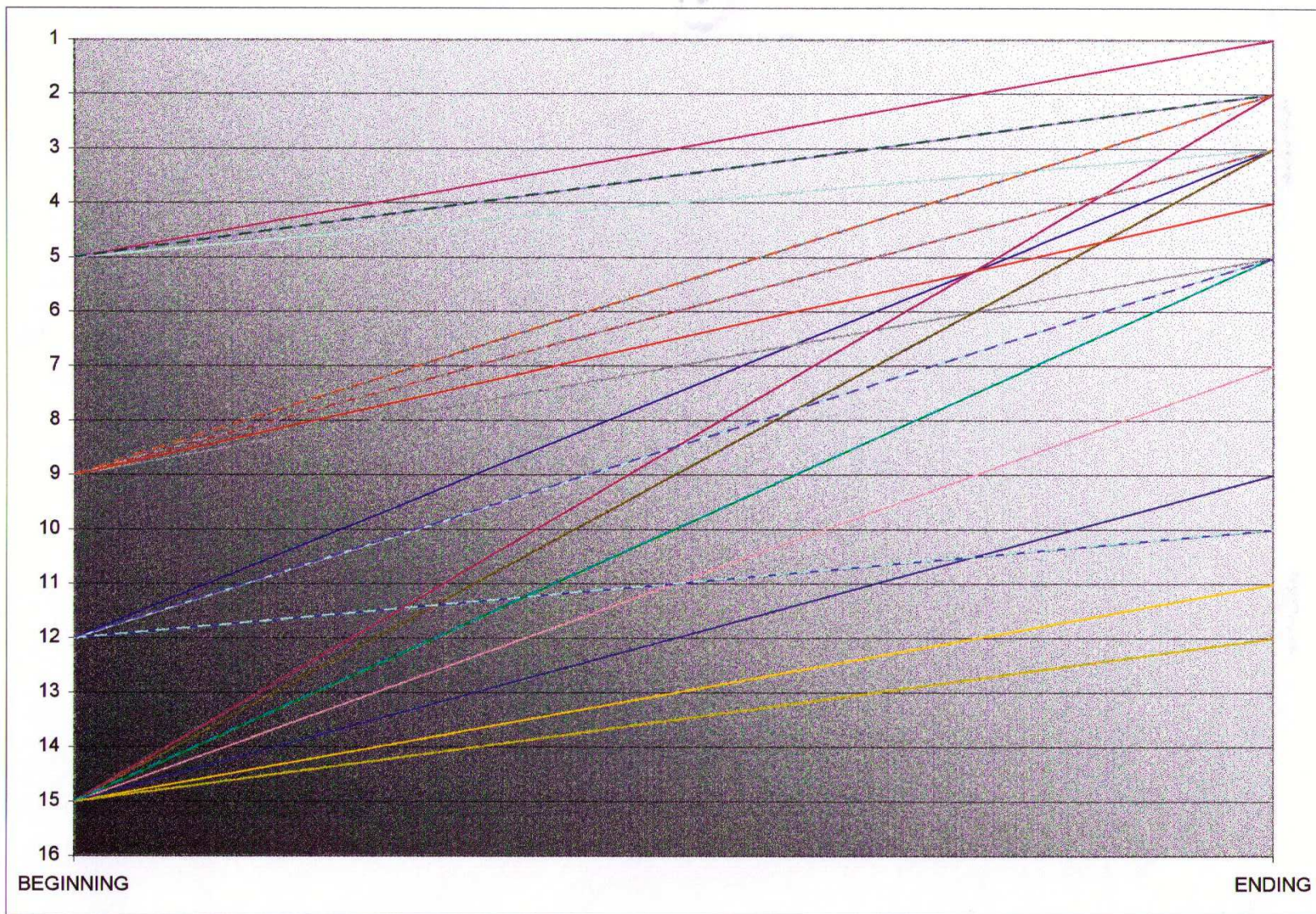
Average Shade Change

5.785714286

Value Changes for Patients

A Shades Only

Patient Group: All Patients



Value Changes for Patients

B Shades Only

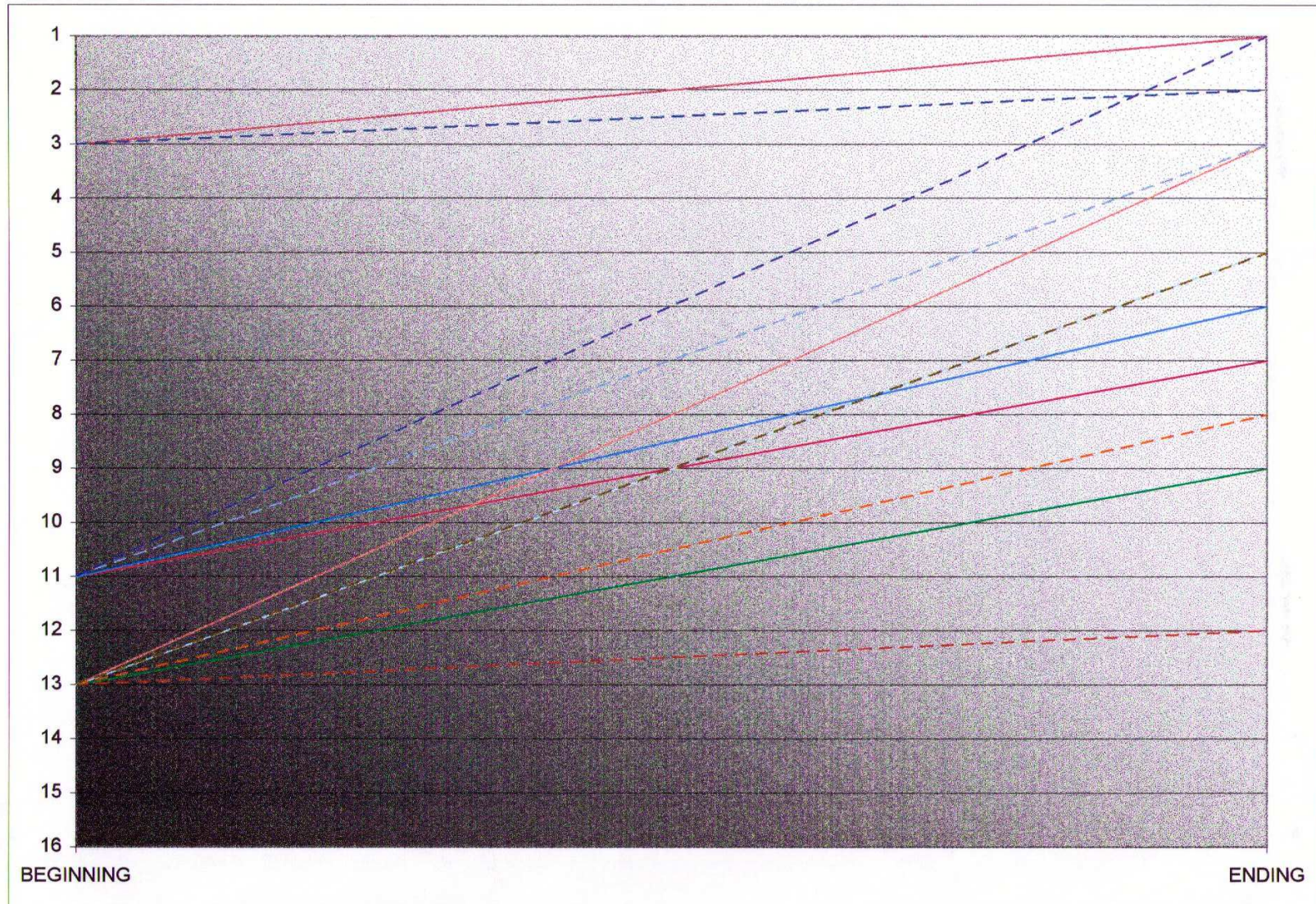
ALL PATIENTS

| PATIENT/TOOTH | BEGINNING SHADE | ENDING SHADE | BEGINNING VALUE | ENDING VALUE | VALUE CHANGE |
|-----------------------------|-----------------|--------------|-----------------|--------------|--------------|
| BM | B3 | C2 | 11 | 7 | 4 |
| SS/1 | B4 | A3 | 13 | 9 | 4 |
| RB/1 | B4 | A2 | 13 | 5 | 8 |
| MU/2 | B4 | A3 | 13 | 9 | 4 |
| DB/1 | B2 | B1 | 3 | 1 | 2 |
| JG | B3 | C1 | 11 | 6 | 5 |
| LG/1 | B4 | A3 | 13 | 9 | 4 |
| CM/1 | B4 | B2 | 13 | 3 | 10 |
| NT/2 | B4 | A2 | 13 | 5 | 8 |
| BC/2 | B4 | A3.5 | 13 | 12 | 1 |
| MJ/1 | B3 | B2 | 11 | 3 | 8 |
| ML/3 | B3 | B1 | 11 | 1 | 10 |
| KW/1 | B4 | A2 | 13 | 5 | 8 |
| KW/3 | B4 | D4 | 13 | 8 | 5 |
| AC/1 | B2 | A1 | 3 | 2 | 1 |
| MM/2 | B4 | A2 | 13 | 5 | 8 |
| Average Shade Change | | | | | 5.375 |

Value Changes for Patients

B Shades Only

Patient Group: All Patients



Value Changes for Patients

C Shades Only

ALL PATIENTS

| PATIENT/TOOTH | BEGINNING SHADE | ENDING SHADE | BEGINNING VALUE | ENDING VALUE | VALUE CHANGE |
|---------------|-----------------|--------------|-----------------|--------------|--------------|
| EC/2 | C1 | B1 | 6 | 1 | 5 |
| MR/2 | C1 | A1 | 6 | 2 | 4 |
| M/2 | C2 | A1 | 7 | 2 | 5 |
| KE | C4 | A2 | 16 | 5 | 11 |
| BB/2 | C4 | B2 | 16 | 3 | 13 |
| TB/1 | C4 | D3 | 16 | 10 | 6 |
| YS/1 | C4 | D3 | 16 | 10 | 6 |
| YS/2 | C2 | A1 | 7 | 2 | 5 |
| YS/3 | C2 | A1 | 7 | 2 | 5 |
| CM | C4 | C2 | 16 | 7 | 9 |
| ML/2 | C1 | A1 | 6 | 2 | 4 |
| KC/1 | C4 | D3 | 16 | 10 | 6 |

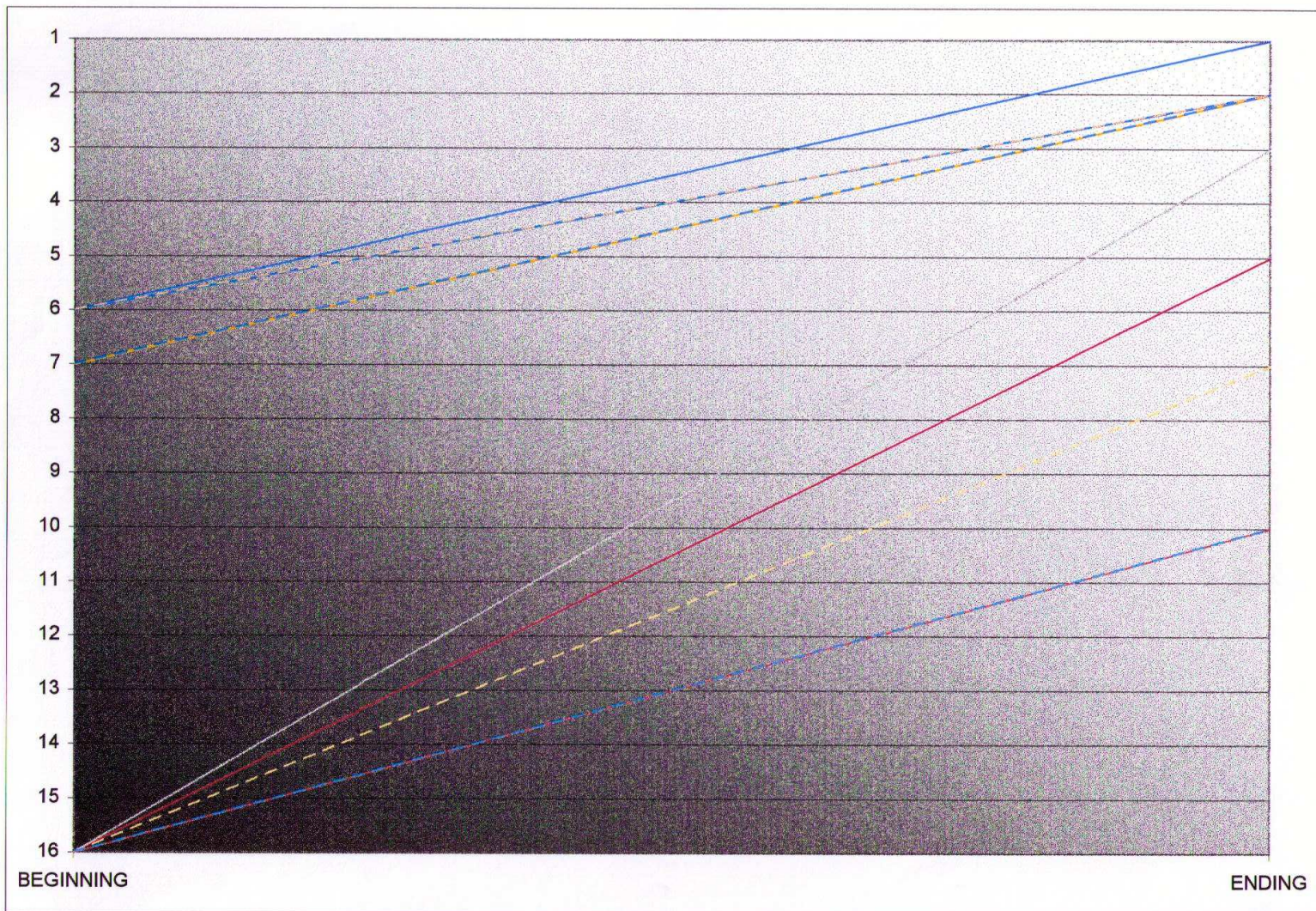
Average Shade Change

6.583333333

Value Changes for Patients

C Shades Only

Patient Group: All Patients



Value Changes for Patients

D Shades Only

ALL PATIENTS

| PATIENT/TOOTH | BEGINNING SHADE | ENDING SHADE | BEGINNING VALUE | ENDING VALUE | VALUE CHANGE |
|---------------|-----------------|--------------|-----------------|--------------|--------------|
| BL/3 | D3 | C2 | 10 | 7 | 3 |
| KP/2 | D3 | D2 | 10 | 4 | 6 |
| KM/1 | D2 | A1 | 4 | 2 | 2 |
| BL/1 | D3 | C2 | 10 | 7 | 3 |
| K/1 | D3 | D2 | 10 | 4 | 6 |
| EG/2 | D4 | C1 | 8 | 6 | 2 |
| BB/1 | D3 | B2 | 10 | 3 | 7 |
| CM/2 | D3 | A1 | 10 | 2 | 8 |
| NT/1 | D3 | A1 | 10 | 2 | 8 |
| CP | D3 | B2 | 10 | 3 | 7 |
| CD/1 | D3 | B2 | 10 | 3 | 7 |
| CD/2 | D3 | A2 | 10 | 5 | 5 |
| MJ/2 | D2 | A1 | 4 | 2 | 2 |
| ML/1 | D3 | B2 | 10 | 3 | 7 |
| KC | D4 | B1 | 8 | 1 | 7 |

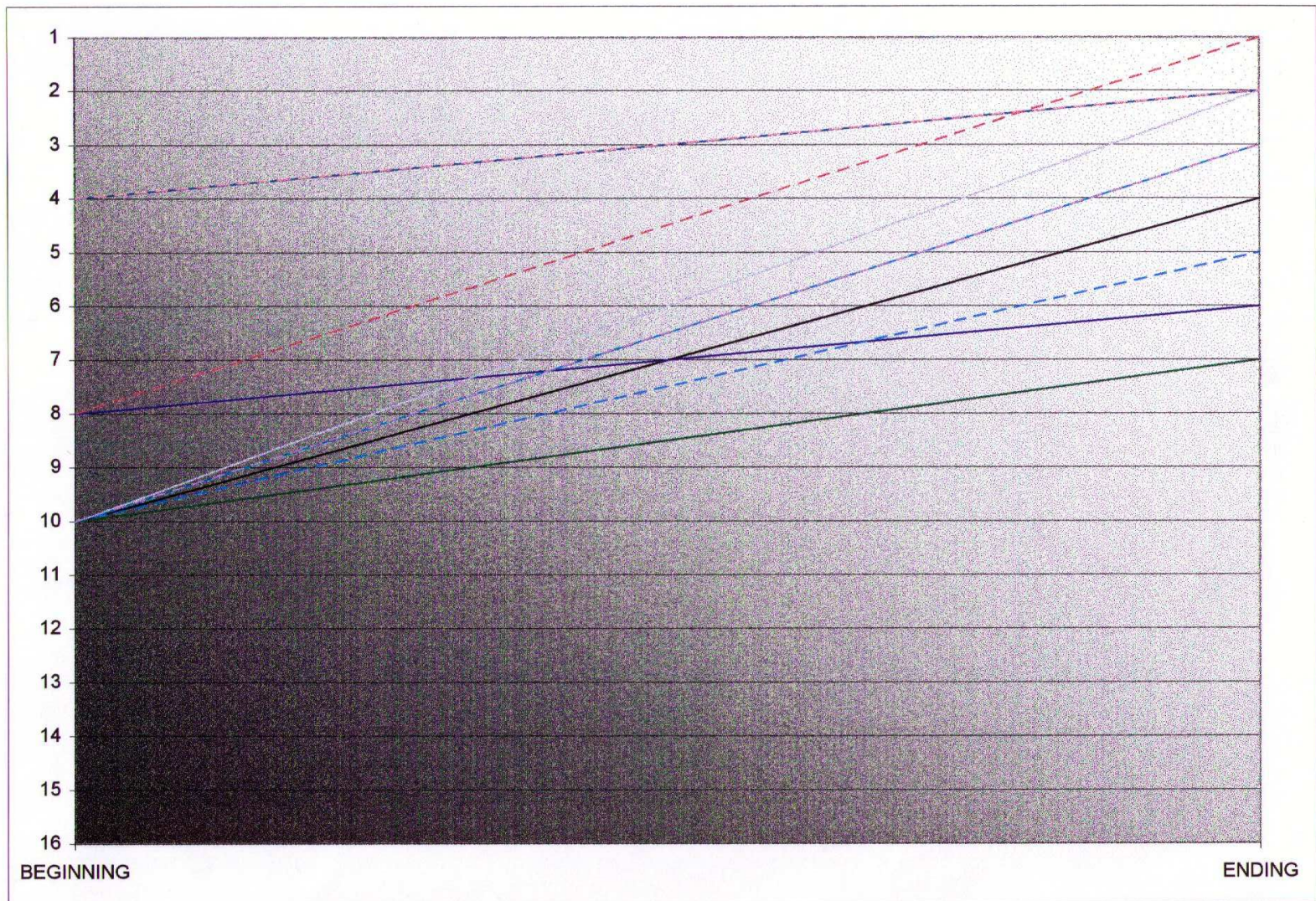
Average Shade Change

5.333333333

Value Changes for Patients

D Shades Only

Patient Group: All Patients



Quick White

Material Safety Data

We provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. Individuals receiving this information must exercise their independent judgment in determining its appropriateness for a particular purpose.

We makes no representations, or warranties, either expressed or implied, of merchantability, fitness for a particular purpose with respect to the information set forth herein or to the product to which the information refers. Accordingly, we will not be responsible for damages resulting from the use of or reliance upon this information.

Hydrogen Peroxide Solution 35-40% by Volume

PRODUCT IDENTIFICATION

Synonyms: Bleach: Bleaching Solution: Liquid Phase: Peroxide

Formula CAS No: 7722-84-1

Molecular Weight: 34.01

Chemical Formula: H₂O₂

Hazardous Ingredients: None

PRECAUTIONARY MEASURES

DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE, CAUSE SEVERE BURNS. HARMFUL IF SWALLOWED OR INHALED.

Do not get in eyes, on skin or in clothing. Avoid breathing mist.
Keep from contact with clothing and other combustible materials.
Do not store near combustible materials.
Use with adequate ventilation.
Wash thoroughly after handling.

EMERGENCY/FIRST AID

In case of contact immediately flush skin or eyes with plenty of water for at least 15 minutes. For eyes, get medical attention. If swallowed, give water or milk to drink. Get medical attention immediately. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. In all cases call a physician.

DOT Hazard Class: Oxidizer

SECTION 1: Physical Data

Appearance: Clear, Colorless Liquid

Odor: Acrid Odor

Solubility: Infinitely Soluble in Water

Boiling Point: 106°C (226° F)

Melting Point: -25°C (-13° F)

Specific Gravity: 1.11

Vapor Density (Air=1): 1.17

Vapor Pressure (mm Hg): 25 at 30°C (86° F)

Evaporation Rate (BuAc=1): <1

SECTION 2: Fire and Explosion Information

Fire: Not combustible, however, substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Increases the flammability of combustibles, organic and readily oxidizable materials.

Explosion: Contact with oxidizable substances may cause extremely violent combustion. Drying of concentrated hydrogen peroxide on clothing or other combustible materials may cause fire or explosion.

Fire Extinguishing Media: Water spray may be used to extinguish surrounding fire and cool exposed containers. Water spray will also reduce fume and irritant gases.

Special Information: In the event of fire, wear full protective clothing and NIOSH approved self contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

SECTION 3: Reactivity Data

Stability.

Unstable. Unstable with heat, may result in dangerous pressures. A strong oxidizer, reacts violently upon contact with many organic substances, particularly textile and paper.

Hazardous Decomposition Products.

Decomposes to water and oxygen with rapid heat release. Use vented containers. The solution can decompose violently upon heating.

Hazardous Polymerization.

This substance does not polymerize.

Incompatibilities.

Heat, reducing agents, organic materials, dirt, alkalis, rust and many metals. Spontaneous combustion may occur on standing in contact with readily flammable materials.

SECTION 4: Leak/Spill Information

CAUTION! Caustic material. Causes fires with organic material. Ventilate area of leak or spill. Clean up personnel require protective clothing. Contain and recover liquid when possible. Larger spills: Absorb with vermiculite, dry sand, earth or similar material for disposal of hazardous waste in a RCRA approved facility. Do not flush to sewer. This oxidizing material can increase the flammability of adjacent combustible materials.

Ensure Compliance with local, state and federal regulations.

NFPA Ratings: Health: 2, Reactivity: 1, Flammability: 0, Other: Oxidizer.

SILICA DIOXIDE

PRODUCT IDENTIFICATION

Synonyms: Solid Phase, Bleaching Powder, Silica, Fumed Silica.

PRECAUTIONARY MEASURES

WARNING! MAY BE HARMFUL IF INHALED. MAY CAUSE IRRITATION TO EYES.

Avoid breathing dust, use with adequate ventilation.

Avoid contact with eyes.

Wash thoroughly after handling.

EMERGENCY/FIRST AID

If inhaled, remove to fresh air. If not breathing, give artificial respiration. In case of eye contact, immediately flush eyes with running water for 15 minutes, lifting the upper and lower eye lids occasionally. In case of skin contact, rinse with water. If swallowed, no treatment is indicated (see section 5).

SECTION 1: Physical Data

Appearance: Fine white powder.

Odor: Odorless

Solubility: Insoluble

Boiling Point: No Data Found.

Melting Point: Approximately 3000°F.

Specific Gravity (Water=1): Approximately 2.2.

Vapor Density (air=1): Not Applicable.

Vapor Pressure (mm Hg): Not Applicable.

Evaporation Rate: Not Applicable.

SECTION 2: Fire and Explosion Information

Fire: Not Combustible.

Explosion: Not Applicable.

Fire Extinguishing Media: Use media appropriate for surrounding fire.

Special Information: None

SECTION 3: Reactivity Data

Stability: Stable.

Hazardous Decomposition Products: None.

Hazardous Polymerization: Substance does not polymerize.

Incompatibilities: None.

SECTION 4: Leak/Spill Information

Clean up personnel require protective clothing, eye protection and respiratory protection.

Spills: Place in DOT approved containers.

Disposal Methods: Dispose contaminated product in a manner approved for this material.

Ensure compliance with local, state and federal regulations.

SECTION 5: Exposure/Health Effects

Inhalation: Repeated or prolonged inhalation may cause delayed injury to lungs. Symptoms include undue breathlessness, cough and sputum production.

Ingestion: None currently known.

Skin Exposure: None currently known.

Eye Exposure: Dust may irritate the eye.

Chronic Exposure: No specific information available.

Aggravation of Pre-existing Condition

QuickWhite Home kits:

First barrel: Glycerine Carbapol 940 Hydroxypropyl Methyl Cellulose Xylitol Triethanolamine Wintergreen Flavoring

Second barrel: Hydrogen peroxide

Manufacture: Quickwhite, Utah

Nine Popular Products & Some of Their Important Characteristics

| A | B | C† | D‡ | E | F | G | H | I | J | K |
|-------------------------------------------------------|-------------|------------------------------------------------------------|-----|-----------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-------------|-------------------------------------------|------------------------------------------|----------------|
| Brands and Company (in alphabetical order) | Cost per ml | Assayed Percent H ₂ O ₂ in Mixed Gel | pH | Bleach Components | Gingival Protection Recommended by Bleach Co. | Lights Recommended by Bleach Co. | Ease of Use | Total Bleach Contact Time (minutes/tooth) | Total Light Contact Time (minutes/tooth) | Post-C Sensiti |
| Apollo Secret DMD 805-381-2700 | | 17.0% | 5.1 | Liquid + Gel | NONE but CRA data indicate need | -Apollo 95 E -Apollo Elite -Any halogen light | Good | 30 min. | 0.45 min. | |
| Hi Lite Shofu Dental 650-324-0085 | | 22.7% -Any laser | 5.1 | Liquid + Powder | ORABASE VASELINE & rubber dam | -Any halogen light -Any plasma arc light -Argon laser -No light | Fair | 30 min. | 30 min. (per arch) | |
| Opalescence Extra Ultradent Products 801-572-4200 | | 32.9% | 5.5 | Ready to Use Gel in Syringe | OPAL DAM low viscosity light cured resin | -Any halogen light -High intensity halogen light -Any plasma arc light -Any laser | Excellent | 15 min. | 0.5 min. | |
| Powergel Welch Ailyn/Kreativ 858-621-6600 | | 32.6% | 3.8 | Liquid + Powder | POWERBLOCK high viscosity light cured resin | -Kreativ Kuring Light | Good | 18 min. | 3 min. | |
| Quasarbrite Spectrum Dental 310-845-3160 | | 29.8% | 7.9 | 4 Liquids + Powder | FAST DAM high viscosity light cured resin | -AccuCure 3000 -Pac Light -Any laser -High intensity halogen light | Good | 36 min. | 3 min. | |
| Quickwhite Universal LumaChem 801-256-3322 | | 30.6% | 7.5 | Liquid + Powder | PAINT-ON DENTAL DAM low viscosity light cured resin or rubber dam | -No light -Any laser -Any plasma arc light -Any halogen light -No light | Good | 36 min. | 3 min. | |
| Rembrandt Virtuoso Lightning Den-Mat 805-992-8491 | | 33.9% | 4.8 | Ready to Use Gel in Syringe | PAINT-ON DENTAL DAM low viscosity light cured resin | -Virtuoso Xenon Power Arc -Any halogen light -No light | Excellent | 20 min. | 2 min. | |
| Rembrandt Xtra Comfort Chairside Den Mat 805-922-8491 | | 13.8% | 5.8 | Ready to Use Gel in Syringe | PAINT-ON DENTAL DAM low viscosity light cured resin | -No light recommended | Good | 20 min. | 0 | none |
| White Speed Discus Dental 310-845-8200 | | 5.7% | 5.7 | Ready to Use Gel in Syringe | NONE recommended, & none needed | -No light recommended | Good | 30 min. | 0 | none |

†C Assayed just before placement on teeth or immediately after mixing following USP 24 monograph for Hydrogen Peroxide (H₂O₂) Concentrate (p. 836).

‡D pH below 5.5 may etch enamel. CRA data show etched enamel requires many weeks to return to normal appearance (JDR Mar '86 65:312 #1284).

*L VITAPAN 3D-Master Tooth Guide using value (v) & chroma (c) with recalls at initial (I) & 1 week (wk).
Formula: (v_i + c_i) - (v_{wk} + c_{wk}) = shade change.

SUMMARY OF CHART: All products tested lightened test subjects' teeth 1-2 shades*, & no one product or technique produced substantially lighter teeth. Use of light did not produce perceptibly lighter teeth. The syringe dispensed premixed bleach gel concept made Opalescence Xtra & Rembrandt Virtuoso Lightning noticeably easier to use.