

# USE OF GREY CARD

*Achieving, recording and communicating ideal shades in dentistry*



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*Pioneers of dental photography training and research*

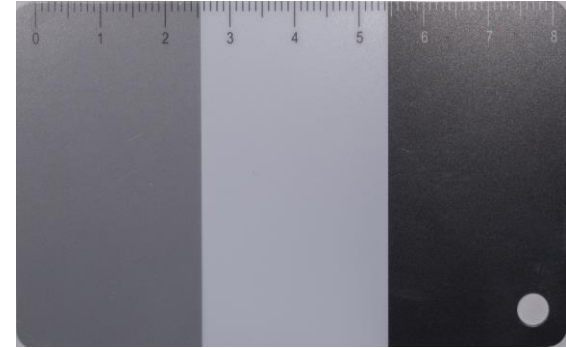
No matter how hard we try it is extremely difficult to capture the true colors of teeth as we see them ( as per the technology available today - NO CAMERA of the world is capable of recording true colors and that to consistently)

- Even the best cameras can go wrong
- Despite using fully manual settings colors might show some alterations in pictures taken at different times

# The way out? 18% GREY CARDS

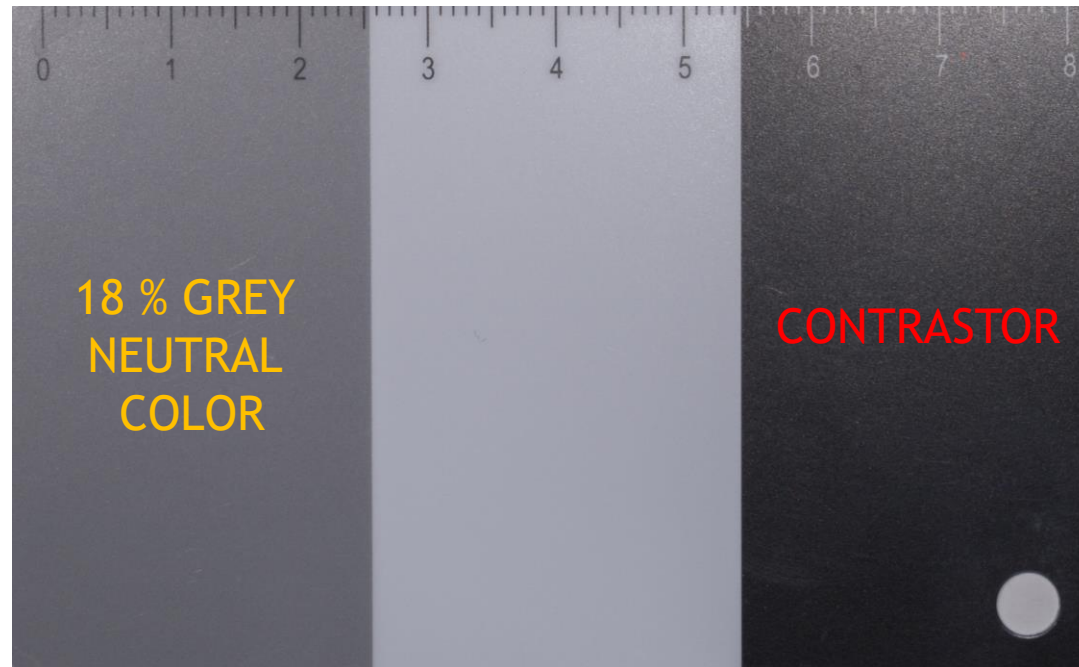
- The only way to record colors consistently or at least reduce the errors in recording colors is by
- USING A GREY CARD
- DOING COLOR CORRECTION (in a software) to remove any faulty color casts that occur due to flash light, angle, exposure settings, white balance settings etc.

# What is a Grey Card?



- It is a simple card which is grey in color but manufactured using a very high Quality Control protocols and printed using the best technology available
- It is used by some of the best professional photographers of the world during commercial shoots where colors hold prime importance
- It is essentially 18 % GREY
- Dental Photography grey cards are usually credit card size and autoclaveable
- They last for a life time
- The almost never loose color if maintained and preserved cautiously

This is an 18 % Grey Card (On left is 18 % grey, center is white and right is black so one can use as a contrastor as well)



# Theory behind A grey Card

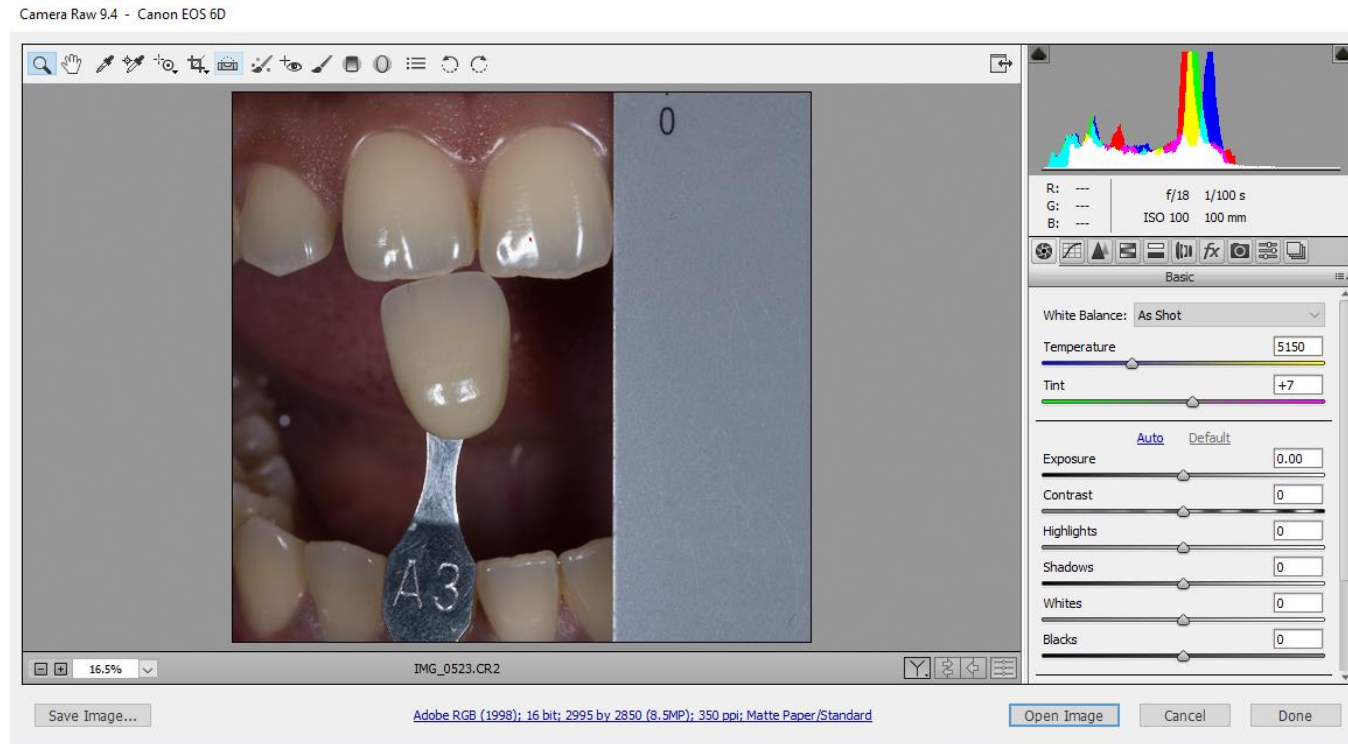
- All cameras meter in a manner to achieve MID TONES
- This mid tone is essentially neither too white nor too black
- This is the aim of metering for every camera - to achieve a balance between not too white and not too black
- Now neither too white or neither too black is essentially GREY
- This means every camera sees in GREY during metering or aims at achieving a neutral 18 % grey

# How A grey card fits in for shade match?

- When we do shade matching we keep an 18 % grey card within the confines of the image we are composing
- Essentially what we are doing by this is that ... we are ready to tell our image processing software that in the image we have an area which is 18 % grey



# When we import this in image processing software like Adobe Camera RAW







This is what it looks like

Color calibration histogram showing RGB channels.

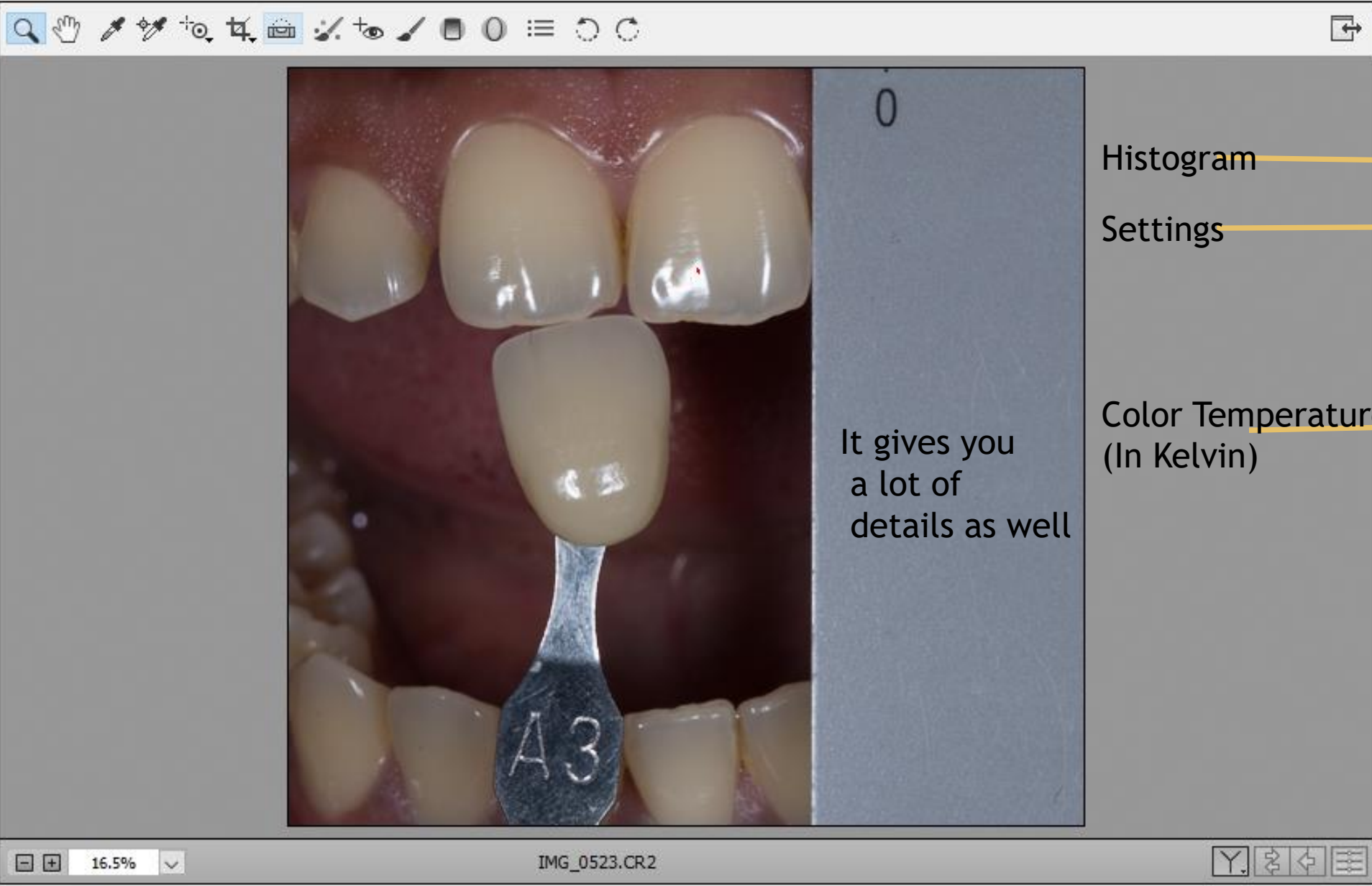
Technical data:  
R: ---  
G: ---  
B: ---  
f/18 1/100 s  
ISO 100 100 mm

Basic tab settings:  
White Balance: As Shot  
Temperature: 5150  
Tint: +7  
Exposure: 0.00  
Contrast: 0  
Highlights: 0  
Shadows: 0  
Whites: 0  
Blacks: 0

Save Image...

Adobe RGB (1998); 16 bit; 2995 by 2850 (8.5MP); 350 ppi; Matte Paper/Standard

Open Image



Histogram

Settings

It gives you a lot of details as well

Color Temperature  
(In Kelvin)

Histogram

Settings

White Balance: As Shot

Temperature: 5150

Tint: +7

Exposure: 0.00

Contrast: 0

Highlights: 0

Shadows: 0

Whites: 0

Blacks: 0



Save Image...

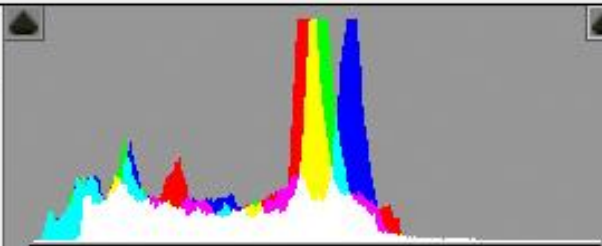
Adobe RGB (1998); 16 bit; 2995 by 2850 (8.5MP); 350 ppi; Matte Paper/Standard

Open Image

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All we need to do is  
Select The  
white balance  
tool  
And POINT out  
to the image  
processing  
software  
as to where 18  
% grey color is  
present



R: ---  
G: ---  
B: ---

f/18 1/100 s  
ISO 100 100 mm



White Balance: As Shot

Temperature 5150

Tint +7

Auto Default

Exposure 0.00

Contrast 0

Highlights 0

Shadows 0

Whites 0

Blacks 0

16.5%

IMG\_0523.CR2



Save Image...

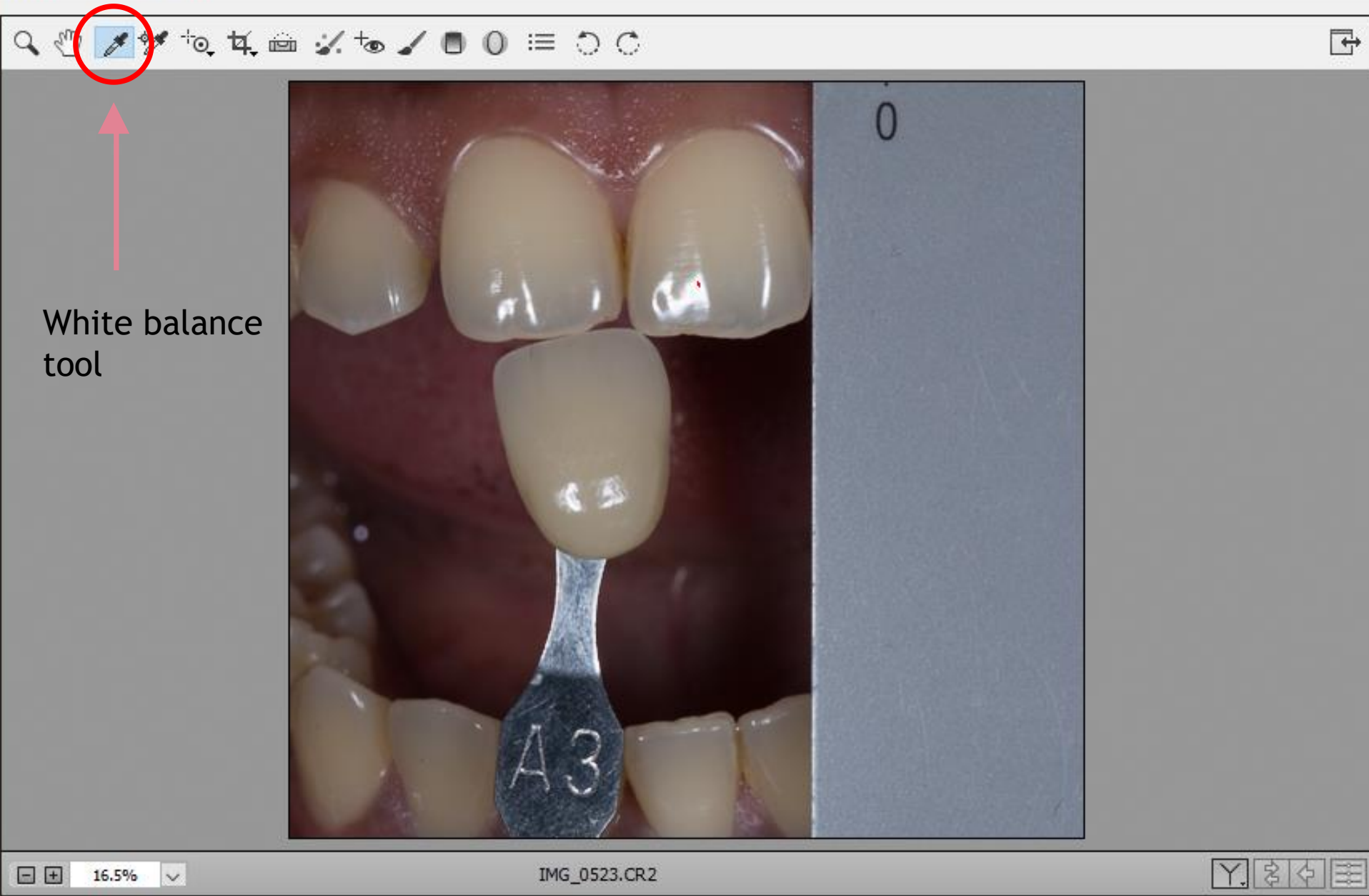
Adobe RGB (1998); 16 bit; 2995 by 2850 (8.5MP); 350 ppi; Matte Paper/Standard

Open Image Cancel Done



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White balance tool

The right-hand panel of the Camera Raw interface contains a histogram at the top, showing a distribution of colors with a prominent peak in the yellow-green range. Below the histogram, camera metadata is displayed: 'R: ---', 'G: ---', 'B: ---', 'f/18', '1/100 s', 'ISO 100', and '100 mm'. A row of icons for various adjustment tools follows. The 'Basic' tab is selected, showing the 'White Balance' dropdown set to 'As Shot'. Below this are sliders for 'Temperature' (set to 5150) and 'Tint' (set to +7). Further down are sliders for 'Exposure' (0.00), 'Contrast' (0), 'Highlights' (0), 'Shadows' (0), 'Whites' (0), and 'Blacks' (0).

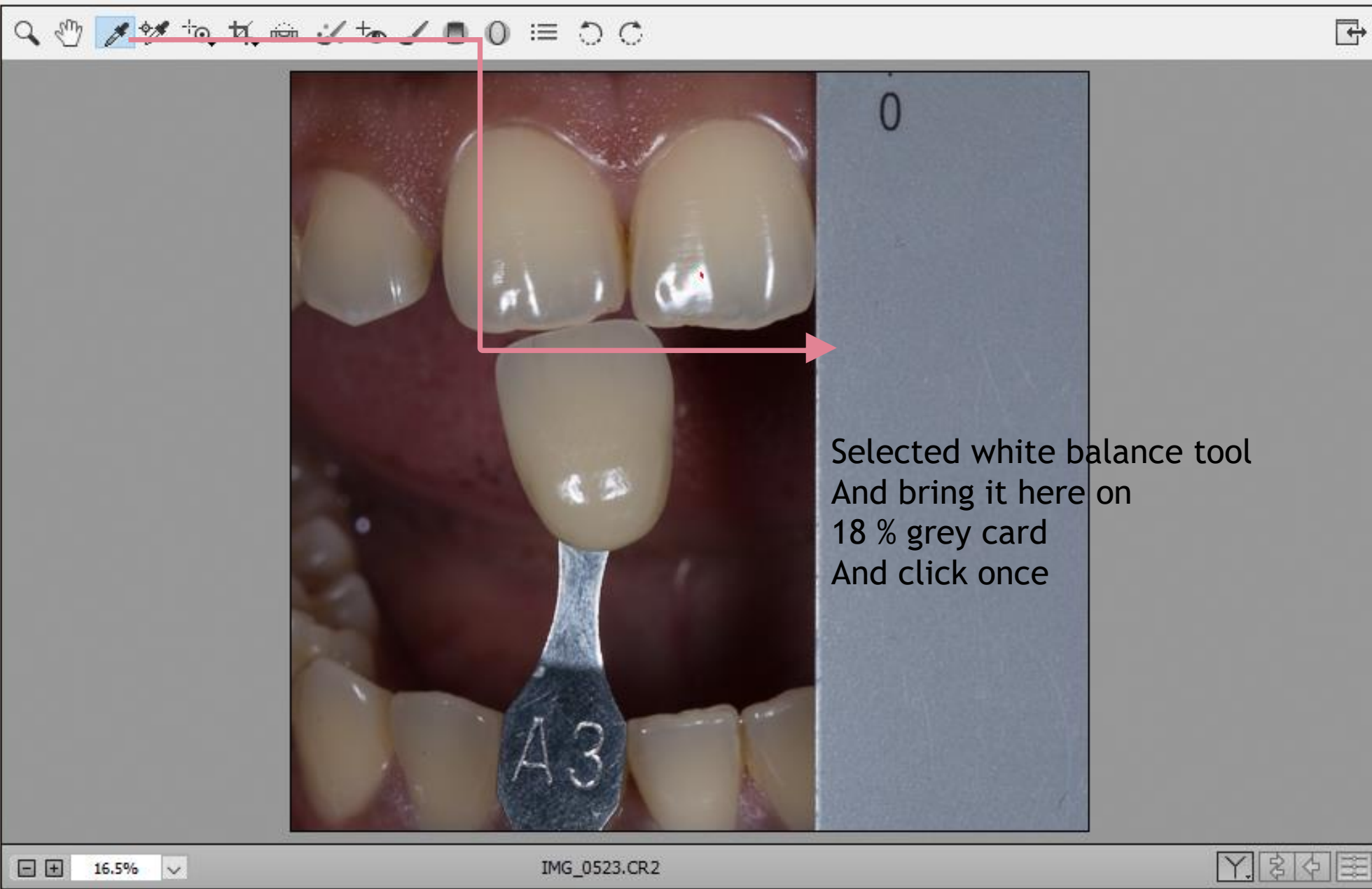
Parameter	Value
White Balance	As Shot
Temperature	5150
Tint	+7
Exposure	0.00
Contrast	0
Highlights	0
Shadows	0
Whites	0
Blacks	0

Save Image...

Adobe RGB (1998); 16 bit; 2995 by 2850 (8.5MP); 350 ppi; Matte Paper/Standard

Open Image | Cancel | Done





Selected white balance tool  
And bring it here on  
18 % grey card  
And click once

Histogram

R: --- f/18 1/100 s  
G: --- ISO 100 100 mm  
B: ---

Basic

White Balance: As Shot

Temperature 5150

Tint +7

Auto Default

Exposure 0.00

Contrast 0

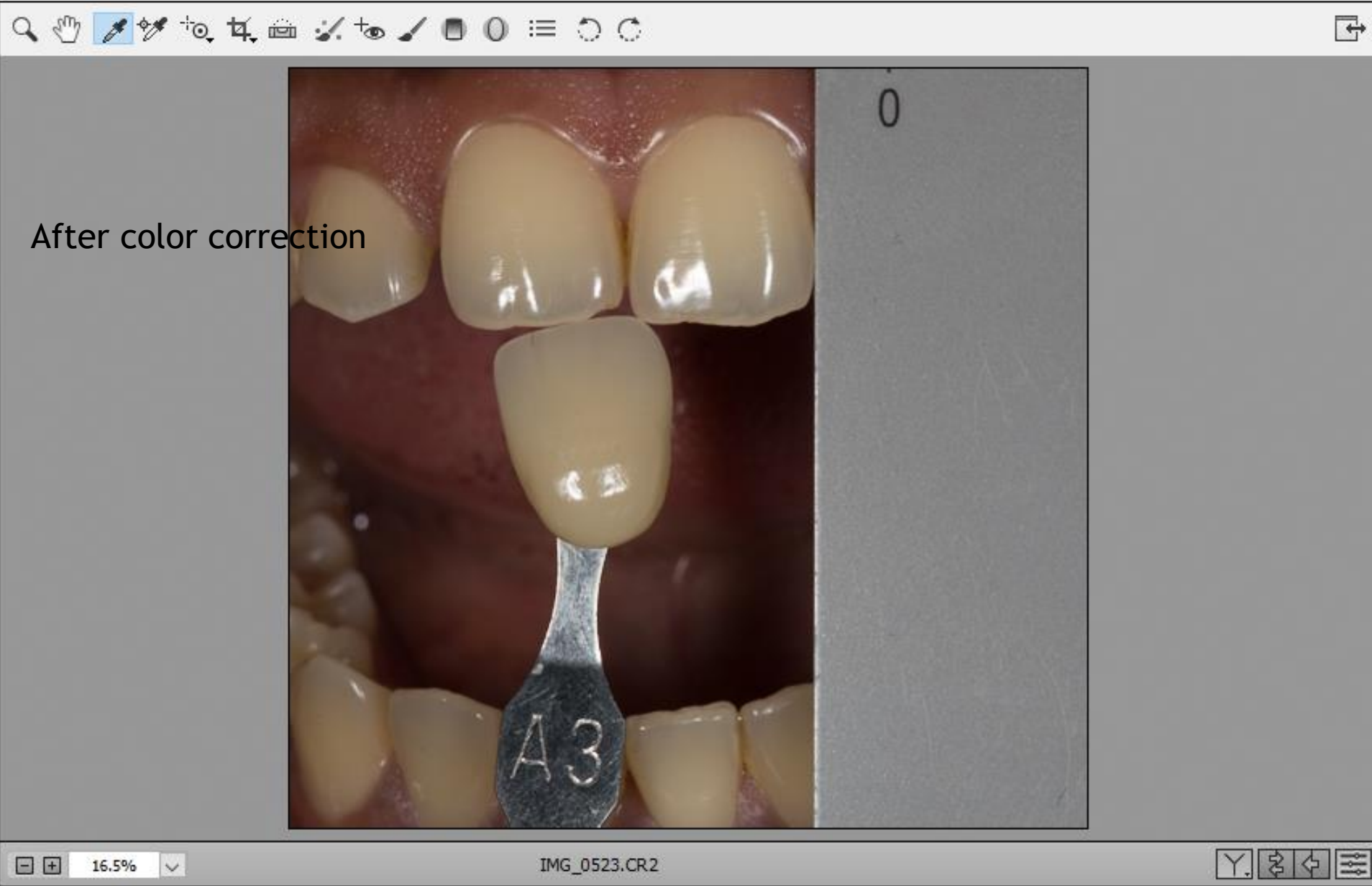
Highlights 0

Shadows 0

Whites 0

Blacks 0

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0

R: --- f/18 1/100 s  
G: --- ISO 100 100 mm  
B: ---

Basic

White Balance: Custom

Temperature 6100

Tint +2

Auto Default

Exposure 0.00

Contrast 0

Highlights 0

Shadows 0

Whites 0

Blacks 0

After color correction

Save Image...

Adobe RGB (1998); 16 bit; 2995 by 2850 (8.5MP); 350 ppi; Matte Paper/Standard

Open Image Cancel Done



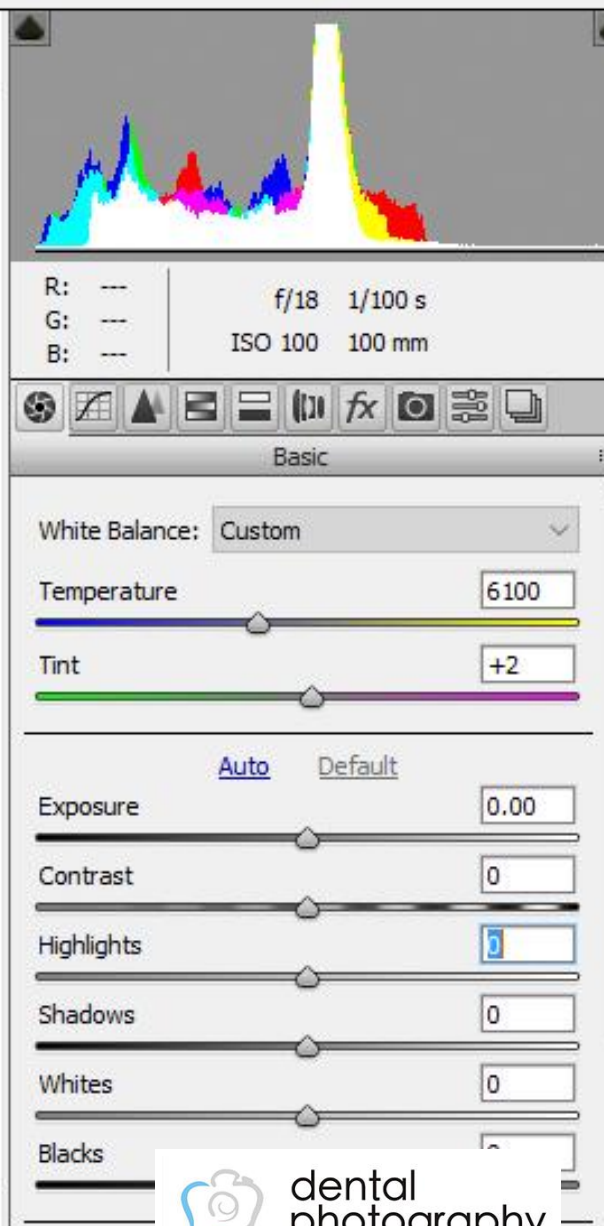
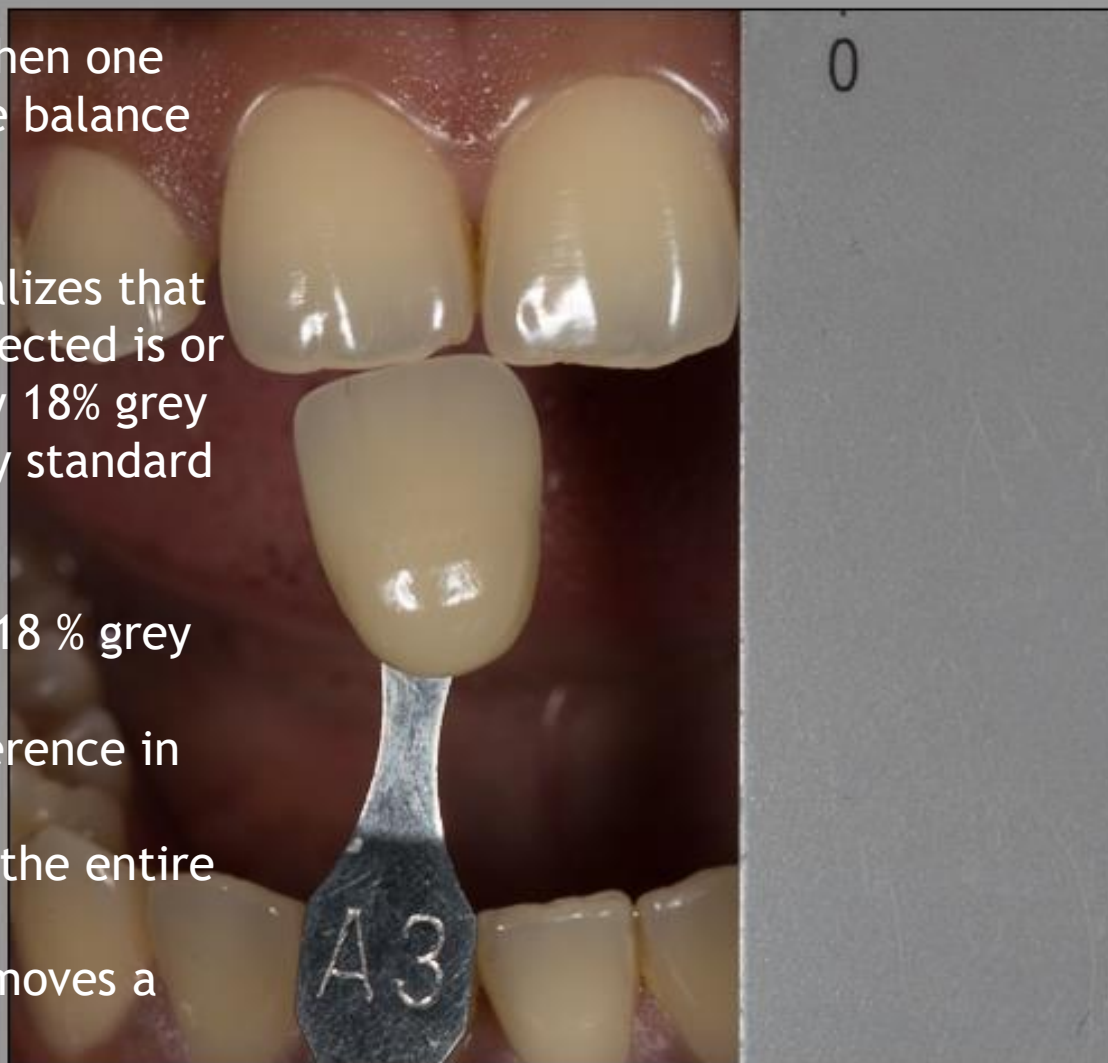
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What happens when one selects the white balance tool?

The software realizes that the point we selected is or has to be exactly 18% grey. It has a 18% grey standard inbuilt.

It compares our 18% grey with its standard. If there is a difference in color, it corrects it for the entire image. This is how it removes a color cast.



16.5%

IMG\_0523.CR2

Save Image...

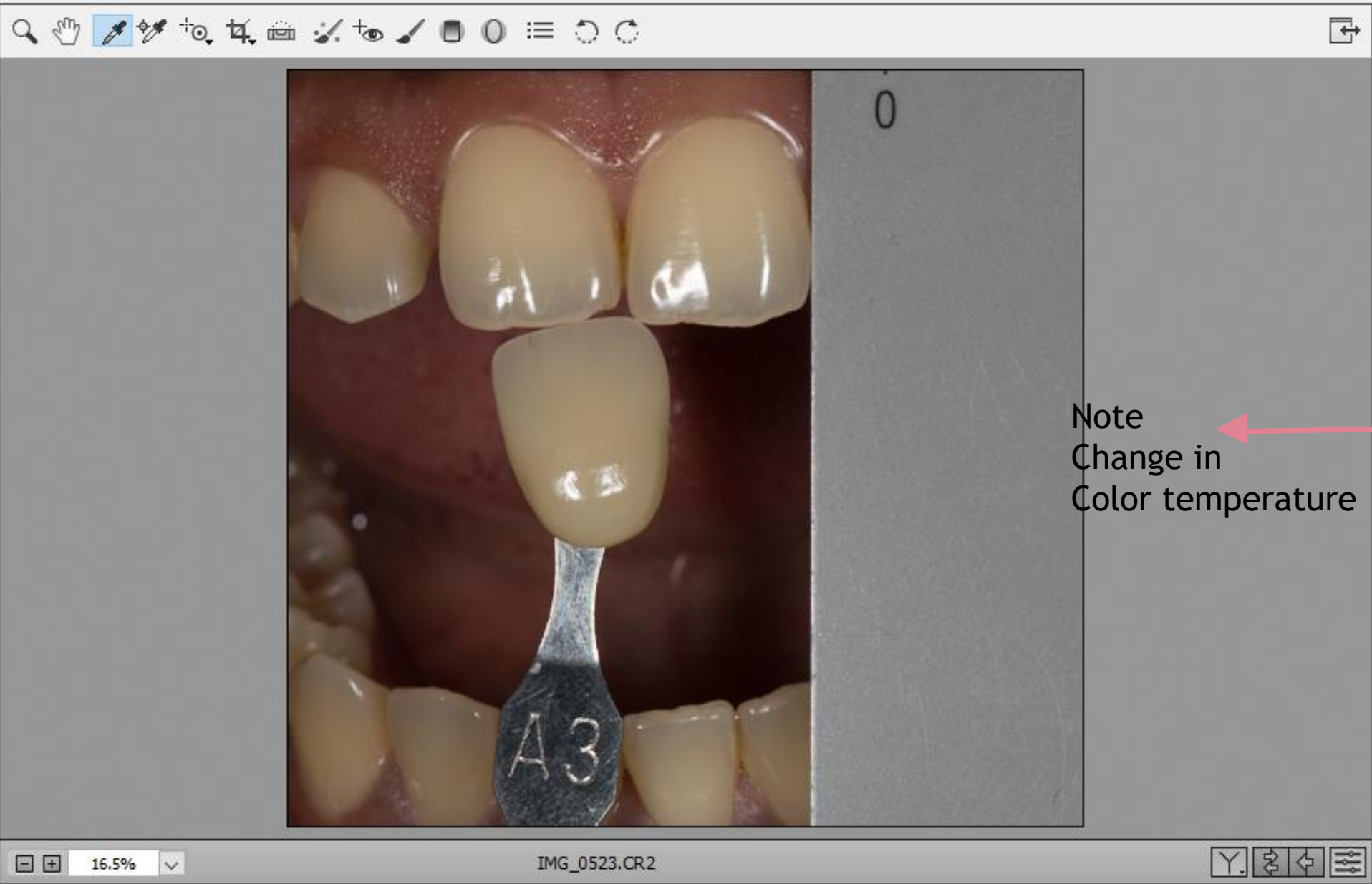
Adobe RGB (1998); 16 bit; 2995 by 2850 (8.5MP); 350 ppi; Matte Paper/Standard

Open Image

Cancel

Done

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Color calibration target (A3) and grayscale step wedge (0) are visible in the main image area.

Technical data: R: ---, G: ---, B: ---, f/18, 1/100 s, ISO 100, 100 mm

White Balance: Custom

Temperature: 6100 (circled in red)

Tint: +2

Exposure: 0.00

Contrast: 0

Highlights: 0

Shadows: 0

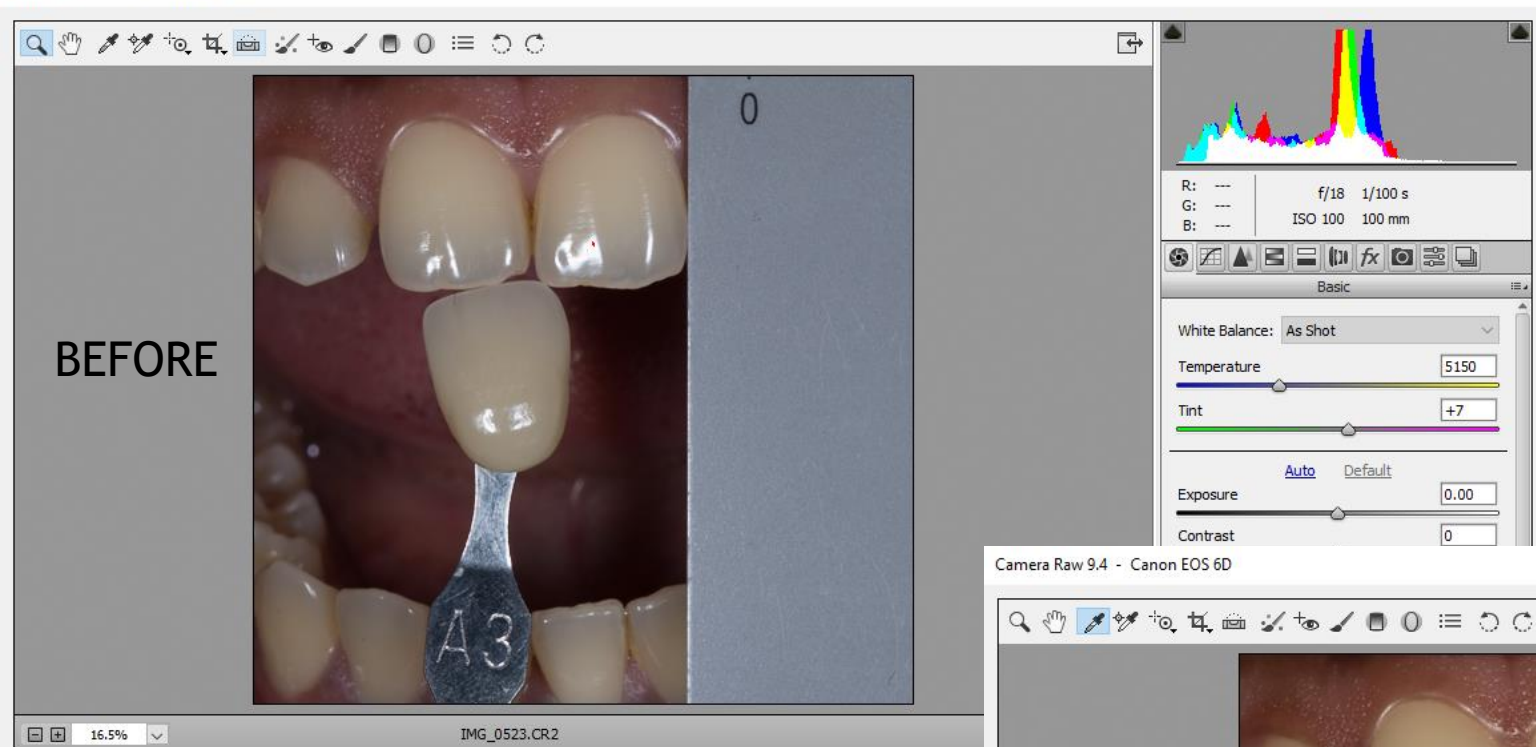
Whites: 0

Blacks: 0

Note  
Change in  
Color temperature



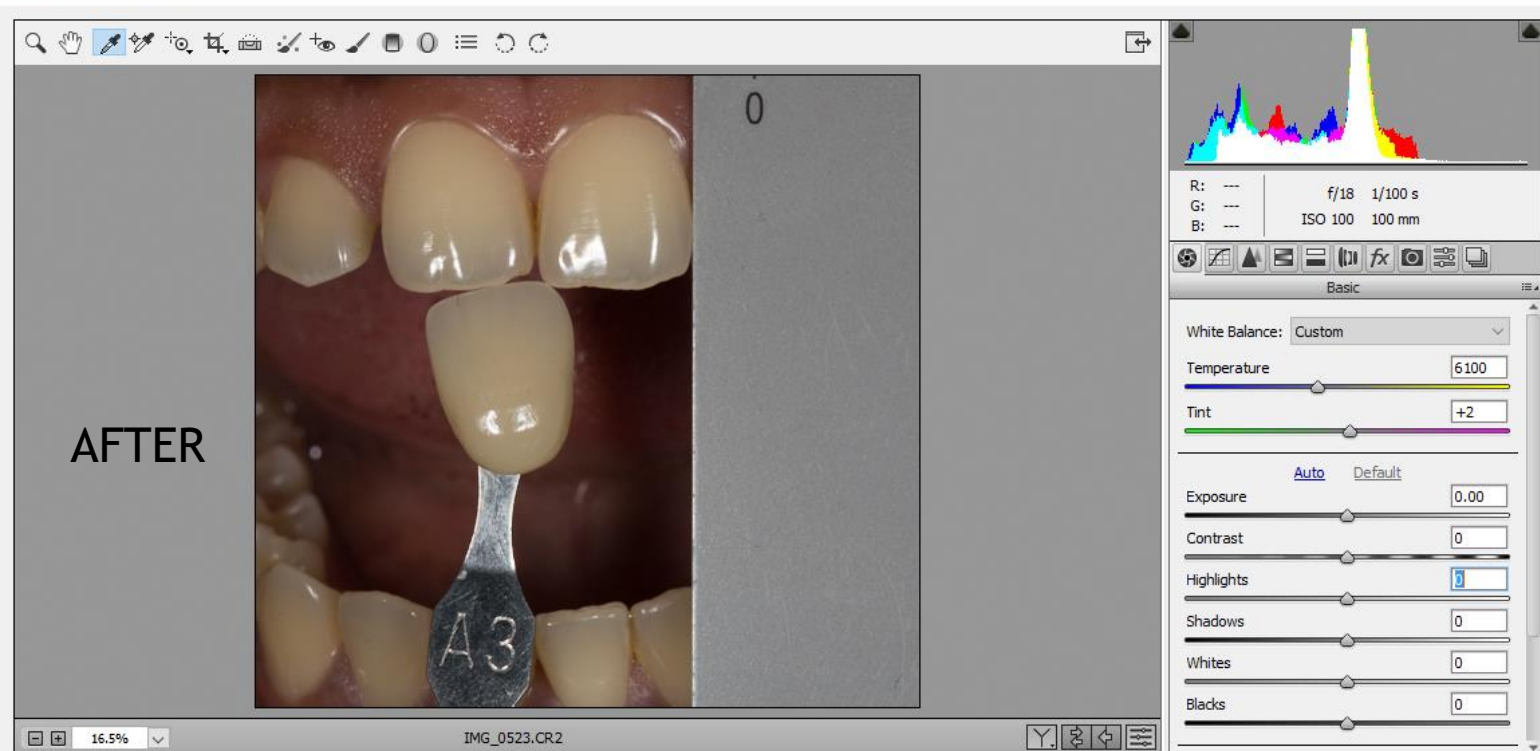
BEFORE



Save Image...

[Adobe RGB \(1998\); 16 bit; 2995 by 2850 \(8.5MP\); 350 ppi; Matte Paper/Standard](#)

AFTER



Save Image...

[Adobe RGB \(1998\); 16 bit; 2995 by 2850 \(8.5MP\); 350 ppi; Matte Paper/Standard](#)

Open Image

Cancel

Done

# This is how it works and removes any color cast

- As you can appreciate in the after image ... there is a HUGE difference in the tooth color after color correction
- This technique can be applied during lab communication by dentist or by lab as well
- During Composite buildups
- And other aesthetic procedures as well
- Note that the images which were opened in ACR (Adobe camera RAW) were RAW files which are way more accurate than a JGEG/ JPG file hence color corrections are more accurate
- Softwares like Picasa must be avoided

# Can this technique be used for mobile phone images?

- Yes although mobile phone images are least accurate this technique still works .... All you need is an authentic 18% grey card (available with [www.dentalphotographyschool.in](http://www.dentalphotographyschool.in), [dentalphotographyschool@gmail.com](mailto:dentalphotographyschool@gmail.com))
- Jpeg/ jpg images can be corrected with this technique
- It is a very simple technique and can be done by labs , ceramists and assistants as well.
- CARE HAS TO BE TAKEN that light does not get reflected from the grey card back onto the camera ... if this happens the card will appear silver and not grey. Keeping the card at an angle to the lens would be a good technique to avoid this mistake.

# Equipment used for this write up

- Canon 6D DSLR
- 100 mm 2.8 macro IS lens
- 67 - 58 step down adapter
- MT 24 EX Twin Flash
- Standard diffusers for flash
- 18 % Grey Card

HOPE THIS ARTICLE HELPS THE DENTISTS AND ALL DENTAL PROFESSIONALS ACROSS THE GLOBE TO DO BETTER DENTAL PHOTOGRAPHY AND DOCUMENTATION. FOR MORE SUCH ARTICLES YOU MAY VISIT [WWW.DENTALPHOTOGRAPHYSCHOOL.IN](http://WWW.DENTALPHOTOGRAPHYSCHOOL.IN) OR WRITE TO US ON THE ABOVE ADDRESS OR CALL US ON +91 99204 20317