A COMPREHENSIVE STUDY OF DENTAL MATERIALS AND THEIR TOXIC INGREDIENTS ASSOCIATED WITH NEURO-CUTANEOUS SYNDROME (NCS) AND MORGELLONS, WITH NOTES ON RESEARCH BACKGROUND

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Abstract
Neurocutaneous Syndrome (NCS) and Morgellons were recently described from many patients showing dermatological and neurological disorders. Of the many different possible exposures, the most common were dental materials, especially sealants, liners, bases, cements, adhesives, bonding agents, metals, crowns, and root canal materials. The role of these dental materials as the causative agents of NCS was verified by the application of the cause-effect relationship. The original listing included about 360 products that were originally reported in a previous publication by the same author (Amin, 2005). The present work includes a considerably more extensive listing of 644 products. It is recommended that dentists research MSDS sheets for proposed dental materials to be used, and match blood bio-compatibility test results with patients’ dental history before embark on, at least major, dental procedures.

Introduction on research background
The terms Morgellons, and Neuro-cutaneous Syndrome (NCS) as characterized by Amin (2001-2010) are used interchangeably, yet cautiously, as their symptoms are very similar. While “Morgellons” has never been researched, its etiological agent(s) and remedies have never been identified, these factors for NCS have been well researched and published in refereed medical journals (see below) and patients have been successfully treated. Only a few highly speculative accounts of a wide assortment of purported infectious agents for Morgellons have been published in non-refereed obscure publications, and no “Morgellons” patients have ever been helped.

At the Parasitology Center, Inc. (PCI), we have been researching NCS since 1996. Our early reports on this syndrome included the description of a case with many facial opportunistic infections from Oklahoma (Amin, 1996) and the first naming and diagnosis of NCS from 3 more cases, with a special reference to fibers and springtails (Collembola) (Amin, 2001). By 2003, we were able to provide a comprehensive diagnosis of NCS and establish the link to dental toxins as the causative agents.
Amin (2003) clarified the nature of action of dental liners (bases) in the causation of NCS neurological and dermatological symptoms and provided the history of 3 NCS patients who have recovered following treatment thus establishing a cause-effect relationship. Various versions of this landmark publication were subsequently published elsewhere (Amin 2004 a, b, 2006 a).

The above contributions were researched and published, and patients were successfully treated long before we discovered a similar clinical entity called Morgellons. The only difference is that we, at PCI, have done the research, established a causal relationship with dental toxins, as well as with other less frequent toxic exposures, developed a protocol, and successfully treated patients. All patients that have followed our protocol have invariably recovered.

Most people have had dental work. Many have various degrees of sensitivity to some dental materials to which their bodies manifest varied intensities of symptoms. This epidemic-in-disguise has been routinely misdiagnosed by medical professionals who often label patients as delusional because of their unfortunate description of their neurological symptoms (actually caused by nerve damage) as having been caused by parasite infections. Amin (2004 c) specifically addressed this issue while discussing the clinical history of 24 NCS patients. Of these patients, 7 who have followed our protocol and completed treatment, by the time of publication, have experienced full recovery.

Amin (2005) provided an annotated list of about 360 dental materials that have been involved in the causation of NCS symptoms in patients that we have seen. Toxic ingredients common to all listed chemicals were classed in 4 categories. These categories are found in many more dental chemicals that were not reported in Amin’s (2005) list but existed in our data base; the subject matter of this publication. An overview of NCS (Amin, 2006 b) made special reference to organ system symptomology in 50 patients of both sexes and all age groups, misdiagnoses, storage organs, liners, drug involvement, incubation period, and recovery, with a detailed discussion of 5 relevant cases. Amin (2007) further analyzed 18 new NCS cases that have been in various stages of treatment and recovery and have demonstrated that those patients that have followed and completed our protocol have invariably recovered. Among patients experiencing recovery, 15 have shared their experience and perspectives (Amin, 2009). NCS symptoms stated by 166 patients upon first examination at PCI were reported by Amin (2010). These patients expressed how they felt then and the reasons for which they came to see us in the first place.

**Materials and methods**

The active toxic ingredients established as the causal factors for NCS observed in many of our patients were researched using actual patient histories, interviews, symptomology, and MSDS sheets of dental materials used. Additional dental products including the same toxic ingredients were also similarly studied and reported herein.

**Results and Discussion**

The components in catalysts and bases of Dycal, Life and Sealapex were identified in Amin (2004 a, b) who provided an analysis of the nature of action of the included toxic ingredients causing the
observed dermatological and neurological symptoms in NCS patients. Reference was also made to Fynal, IRM, Sultan U/P, Gluma One Bond and Scotch Bond by Amin (2004 a). These dental products and over 350 others reported by Amin (2005) and additional products included herein are now recognized as toxic. Toxicity and individual reactivity will vary from person to person depending on degree of sensitivity to the compounds which is related to the concentration of the toxic ingredient(s) in the product, amount of product used and the number of teeth involved.

The toxic ingredients common to all 644 dental products reported herein belong in four major categories: Zinc Oxide, Ethyltoluene Sulfonamide (especially in patients with allergy to sulfa and toluene), Titanium Dioxide and other metal compounds (especially in implant patients and others with allergy to metals) and Methacrylate compounds, as well as Calcium Hydroxide. Our studies of the many NCS patients examined indicate that these ingredients are causally associated with their symptoms. When the source (cause) is removed by appropriate dental rehabilitation and detoxification, and other cleansing processes are properly implemented, the patient recovers (effect). It should be noted that while the reported list is far more comprehensive than the one reported earlier by Amin (2005), it may not include all what is there in the market which continually change and increase. I have concluded, however, that the listing of more dental compounds will not make the point any stronger at this time. Dentists should always attempt to identify the toxic elements in the dental products that they use whether they are included in this list or not by examining the relevant OSHA-required MSDS forms especially when they embark on major dental procedures, and should insure their biocompatibility to patients’ biological as well as energy systems.

Please note that toxicity and individual reactivity will vary from person to person and that there is no one product that is “safe” for everyone. What is safe for one person may be toxic for another.

The following is a listing of all 644 dental products studied and their toxic ingredients. The name of the product is bolded and precedes the name of its ingredients:

A-paste, clearfil DC cement: hydrophobic dimethacrylate, bisphenol a diglycidylmethacrylate, triethylene glycol dimethacrylate
Add&Bond: uncured methacrylate

Adhesive Bond II: methacrylates, maleic acid-mono-2-methacryloyloxyethylster
Adper: dimethacrylates

Adper prompt self-etch adhesives: methacrylated phosphoric esters, 2hydroxyethyl methacrylate (HEMA)
Aelite Aesthetic enamel: ethoxylated bisphenol a Diglycidylmethacrylate
Aelite Liner Base: bisphenol a diglycidylmethacrylate, ethoxylated bisphenol a dimethacrylate

Aelite Liner Catalyst: bisphenol a diglycidylmethacrylate, triethylene glycol dimethacrylate
Aelite Purpose Body: ethoxylated bisphenol a dimethacrylate
Aelite Posterior: ethoxylated bisphenol a dimethacrylate
Aelite Packable Dentin: ethoxylated bisphenol a dimethacrylate
Aeliteflo / Aeliteflo LV: ethoxylated bisphenol a dimethacrylate

AH 26 Power: titanium dioxide
Alginate Impression Materials: potassium titanium fluoride
All-Bond 2: dimethacrylates
All-Bond 2 Primer A: na-n-tolyglycine glycidylmethacrylate
All Bond 2 Primer B: bisphenyl dimethacrylate

Alloy primer: 10-methacryloxyloxydecyl dihydrogen phosphate
Amalgam Bonding Base and Catalyst: ethoxylated bisphenol a dimethacrylate, triethylene glycol dimethacrylate
Amalgambond HPA Powder: poly methyl methacrylate
Anchor: Mixture of methacrylate resins, including bisgma
A Paste, Panavia F: hydrophobic aromatic dimethacrylate, hydrophilic aliphatic dimethacrylate, hydrophilic dimethacrylate
Aquasil monophase: titanium dioxide
Aquasil Rigid: titanium dioxide
Aquasil XLV: titanium dioxide
Aquasil Putty: titanium dioxide
Aquasil LV: titanium dioxide
Contemporary Colored Ortho-Jet Powder: plasticized methacrylate polymer
Contour, Precapulated Dental Amalgam: mercury, alloy powder contains silver, tin and copper metals
Core C-1: titanium dioxide
Core-Flo Base/ Catalyst: ethoxlated bisphenol a dimethacrylate, triethylenglycol dimethacrylate, bisphenol a diglycidyl methacrylate
Core Material: urethane dimethacrylate, aliphatic dimethacrylate, aromatic dimethacrylate
Corestore 2 Paste Products ( restorative composite) : uncured methacrylate ester monomers
CR Hybrid: blend of multifunctional methacrylates
CRCS: calcium hydroxide, zinc oxide
Delton Opaque Catalyst 2694, Part-A: aromatic and aliphatic dimethacrylate monomers
Delton Opaque Universal 2694, Part-B: aromatic and aliphatic dimethacrylate monomers
D/E Resin: bisphenol diglycidylmethacrylate, urethane dimethacrylate, hydroxyethyl methacrylate
Dentacolor: dodecandioldimethacrylate
Dentacolor Creative Colorfluids: methacrylates
Dentacolor Connector: methyl methacrylate
Dentacolor Modeling Liquid: methacrylates
Dentacolor Opaque Liquid: methyl methacrylate
Dentacolor Creative Transpafluid T1: methacrylates
Dentacolor Creative Transpafluid T2: methacrylates
Dental Cement Ready Mix Same As Cavit-G Coltosol 40mg: zinc oxide, calcium hydroxide, ethyltoluene sulphate
Dentalis KEZ: zinc oxide and calcium hydroxide
Dentalon plus liquid: n-butyl methacrylate, ethyl methacrylate
Dentalon plus powder: benzyl-5-phenylbarbiturits ure
Dentthese II B: hydroxyethyl methacrylate
Dentex liquid: methyl methacrylate monomer stabilized
Dentex Powder: poly methyl methacrylate
Dental Composite: glass filler materials in aromatic/aliphatic methacrylate resins
Dental Dam: aromatic and aliphatic dimethacrylate
Dentin Adhesive, Light Cure: aliphatic dimethacrylate, aromatic dimethacrylate, polycarboxylic polymethacrylate
Dentweld liquid: methyl methacrylate monomer stabilized
Dentweld Powder: poly methyl methacrylate
Dentpro: zincoxide-eugenol cement
Desenzal: hydroxyethyl methacrylate n/e n/e
DeTrey: silver, titanium dioxide, bismuth oxide, methammine
D.M.M., Die Stone: calcium sulfate, hemihydrate (gypsum), calcium oxide
DMP Bonding Base: methacrylates
DMP Bonding Catalyst: methacrylates
DMP Single Bond (Light Cure): methacrylates
Doc's best root canal sealer with copper: zinc oxide
DT Temporary Dressing: calcium hydroxide
Dual Care Resin Cement: dimethacrylates
DUO-Link Base/Catalyst: bisphenol a diglycidyl methacrylate, triethylenglycol dimethacrylate, urethane dimethacrylate
DuraBase Liquid: methyl methacrylate
Dura conditioner powder: poly ethyl methacrylate
Dura base soft powder: poly ethyl methacrylate
Dura base soft liquid: methyl methacrylate monomer stabilized
DuraFill: methacrylates
DuraGel Liquid: methyl methacrylate
DuraGel Powder: titanium dioxide, plasticized methacrylate polymer
DuraKore Liquid: methyl methacrylate
DuraKore Powder: titanium dioxide, poly ethyl methacrylate
Duralay Liquid: methyl methacrylate
Duralay II Liquid: methyl methacrylate
Duralay II Powder: blend of acrylic copolymer and methacrylate polymer
Duralay-Powder-Blue: methacrylate polymer
Duralay-Powder-Clear: methacrylate polymer
Duralay-Powder-Red: methacrylate polymer
Duralay Temporary Crown & Bridge Powder-Shades: titanium dioxide, plasticized methacrylate polymer
DuraLinier II Liquid: methyl methacrylate
Duratrux: Liquid: methyl methacrylate
Dura-Ortho Liquid: methyl methacrylate
Dura-Ortho Powder: poly methyl methacrylate
Dura Rely-A-Soft Powder: titanium dioxide, poly ethyl methacrylate
Dura Seal Liquid: methyl methacrylate
Dura Seal powder: titanium Dioxide, poly ethyl methacrylate
DuraTray Powder: poly methyl methacrylate
DuraTray II Powder: lef nd of acrylic copolymer and methacrylate polymer
Durelon: zinc oxide
Dycal: calcium hydroxide, ethyltoluene sulfonamides, zinc oxide, titanium dioxide, barium sulphate
Dyrcat: urethane dimethacrylate resin, polymerizable trimethacrylate resin
DyrcatCem Plus Liquid: methacrylate
Dyrcat Extra: methacrylate
Dyrcat Flow: methacrylates
Dyrcat Seal: methacrylate
Ed Primer II-liquid A, panavia F 2.0: 2-hydroxyethyl methacrylate, 10-methacryloyloxydecyl dihydrogen phosphate, n-methacryloyl 5-amino salicylic acid, n,n-diethanol p-toluidine
Ed Primer II-liquid B, panavia F 2.0: n-methacryloyl 5-amino salicylic acid, n,n-diethanol p-toluidine
Ed Primer liquid A, panavia 21: 2-hydroxyethyl methacrylate, 10-methacryloyloxydecyl dihydrogen phosphate, n-methacryloyl 5-amino salicylic acid, n,n-diethanol p-toluidine
Ed Primer liquid B, panavia 21: n-methacryloyl 5-amino salicylic acid, n,n-diethanol p-toluidine
Elan ( Restorative Composite): uncured methacrylate ester monomers
Electric Ortho-Jet Powder: methacrylate copolymer
Embrace WetBond Class V (EMV,EMVA2,EMVA35,EMVB2, EMVD2): acrylate resins
Embrace WetBond First Coat (EMFC): acrylate resins
Embrace WetBond Opaquer (EMOP): acrylate resins
Embrace WetBond Onid Pitt and Fissure Sealant (EMS,EMS3,EMSW,EMSW3): acrylate resins
Embrace WetBond Seal-n-Shine (EMSNS,EMSNY): acrylate resins
Embrace WetBond Universal resin cement (EMCA,EMCAR,EMCS,EMCSR): acrylate resins
Enamel bonding agent: aliphatic dimethacrylate, aromatic dimethacrylate, aromatic amine
Encore AP: bisphenol diglycidyl methacrylate, triethylene glycol methacrylate
Encore Bond: diurethane dimethacrylate, hydroxyethyl methacrylate
EndoFill Slow Setting (powder): zinc oxide
Epic-AP: methacrylate monomers (bi-functional)
Epic-TMPT Composite: di-2-methacryloyloxyethyl
Epiphany. UDMA, pegdma, epbapma, bisrgma. Not to be used by those allergic to methacrylates
3M ESPE Clinpro: bisphenol A diglycidyl, triethylene glycol dimethacrylate, titanium dioxide
Estic Bond Base: methacrylates, (4-methylphenyl) imino bisethanol
Estic Bond Cat: methacrylate
Estic Microfill Base: methacrylates
Estic Microfill Cat: methacrylates
Esthet. X Flow: titanium dioxide, urethane modified bis-gma dimethacrylate, polymerizable dimethacrylate resin
Esthet. X Improved Micro matrix Restorative: titanium dioxide, urethane modified bis-gma dimethacrylate
Estisal LC: methacrylates
Ettch-Free Components A&B: methyl methacrylate
Fi-cem Paste Xeaks Zinc (Mizzy): zinc oxide
Fill In Base Paste Products ( Temporary Crown and Bridge Material): uncured methacrylate ester, methyl methacrylate monomers
Fill In Catakyst Paste ( Temporary Crown and Bridge Material): uncured methacrylate ester monomers
Hy-Bond (shofu): zinc oxide
Hydro-Cast Tissue Treatment Material, Powder: polyethyl methacrylate and higher acrylic ester polymer
Hydro-Cast Tissue Treatment Material, Powder: polyethyl methacrylate and higher acrylic ester
Hybrid Composite (anterior/posterior): urethane dimethacrylate, aliphatic dimethacrylate, aromatic dimethacrylate
Hydrog Desensitizer: 2-hydroxy ethyl methacrylate
Hydrosil XI: calcium sulfate, titanium dioxide, ethylene glycol dimethacrylate
Hyflo Fluid Resin (Liquid): inhibited methyl methacrylate, n,n-dimethyl p-toluidine, ethylene glycol dimethacrylate
Hygenic Repair Resin (Liquid): inhibited methyl methacrylate, inhibited n,n-dimethyl p-toluidine, inhibited ethylene glycol dimethacrylate
Hygenic Denture Liquid (Liquid): inhibited methyl methacrylate, inhibited ethylene glycol dimethacrylate
Hygenic 007 Monomer (Liquid): inhibited methyl methacrylate, n,n-dimethyl p-toluidine, inhibited ethylene glycol dimethacrylate
Hygenic Orthodontic Resin (Liquid): inhibited methyl methacrylate, inhibited n,n-dimethyl p-toluidine, inhibited ethylene glycol dimethacrylate
Hygon Tray Material (Liquid): inhibited methyl methacrylate, inhibited n,n-dimethyl p-toluidine, inhibited ethylene glycol dimethacrylate
Hylyne Base Paste: calcium hydroxide, zinc oxide, butyl benzene sulfonamide
Hypar Denture Liquid (Liquid): inhibited methyl methacrylate, inhibited ethylene glycol dimethacrylate
Hypocal SN: calcium hydroxide
Ideal 1: 2-hydroxyethylmethacrylate
Ideal 1 Adhesion System Primer: 2-hydroxyethylmethacrylate
Ideal Glass Ionomer Band Cement: methyl methacrylate
Ideal Light Cure Bracket Adhesive: methyl methacrylate
Ideal Resin Bonding Agent: methyl methacrylate
Illusion Base: ethoxylated bisphenol A dimethacrylate, triethylene glycol dimethacrylate
Illusion Catalyst: bisphenol A diglycidylmethacrylate, triethylene glycol dimethacrylate
Illusion Color Modifier: triethylene glycol dimethacrylate
Illusion Viscosity Modifier: ethoxylated bisphenol A dimethacrylate
Immediate Liquid: methyl methacrylate, n,n-dimethyl p-toluidine
Instant Tray Liquid: methyl methacrylate, n,n-dimethyl p-toluidine
Instant Tray Powders: methyl methacrylate/ethyl acrylate
Integrity: polymerizable dimethacrylate resins
Interface B: Trimethoxysilyl Propyl Methacrylate
Interval II: zinc oxide
Intro Bonding Resin: bisphenol diglycidylmethacrylate
Investment 847, 847BB: titanium dioxide
Ionosit Microspan: aliphatic dimethacrylate, aromatic dimethacrylate, polycarboxylic polymethacrylate
Ionosit Baseline: aliphatic dimethacrylate, aromatic dimethacrylate, polycarboxylic polymethacrylate
IRM powder: zinc oxide
Jet Acrylic Powder-Jet Tooth Shade, Jet Denture Repair, Ortho-Jet: plasticized methacrylate polymer
Jet Adjuster Brush Cleaner: methyl methacrylate
Jet Liquid, Ortho-Jet-Liquid: methyl methacrylate, n,n-dimethyl p-toluidine
Jet Seal: methyl methacrylate
Jet Tray Liquid: methyl methacrylate, n,n-dimethyl p-toluidine
Jet Tray Powder: plasticized methacrylate polymer
Justi Tray Material liquid: methyl methacrylate
Kalsogen Plus Liquid: eugenol
Kalsogen Plus Powder: zinc oxide
Kalzinol Liquid: eugenol
KaVo Rondolux 2013 Powder 50um 100g ref: 1.000.5955 in PE Container: titanium dioxide
KaVo Rondolux 2013 Powder 27um 100g ref: 1.000.5955 in PE Container: titanium dioxide
Kayon Denture Tinting Stain Special Liquid: methylmethacrylate monomer, inhibited
Kevloc Primer: methacrylates
Kolor + uncured methacrylate ester monomers
Lasting Touch: urethane dimethacrylate resin
Ledermix Powder (cement): zinc oxide, calcium hydroxide, Canada balsam
Life: zinc oxide, ethyltoluene sulfonamide, calcium hydroxide, titanium dioxide, barium sulphate
Light Core: bisphenol diglycidylmethacrylate, ethoxylated bisphenol a dimethacrylate
Light-Curable Block Out Resin: aromatic and aliphatic dimethacrylate
Light Cure Composite Microhybride: mixture of resins based on bis-gma (methacrylates)
Light Cure Dental Composite (Ecosphere): urethane dimethacrylate, aliphatic dimethacrylate, aromatic dimethacrylate
Light Cure Dental Composite: urethane dimethacrylate, aliphatic dimethacrylate, aromatic dimethacrylate
Light Cure Dental Composite (Ecosiut): urethane dimethacrylate, aliphatic dimethacrylate, aromatic dimethacrylate
Light Cure and Dual Cure: methacrylates
Light Curing low-shrinkage Dental Restorative: bis-gma, urethane dimethacrylate
Light and self-cure Dental Resins: Helimolar
Light Cured Space Maintainer Syringe: aromatic aliphatic dimethacrylate monomers
Liquidam: aromatic and aliphatic dimethacrylate monomers
LR Gold: dimethacrylate resin, methacrylate ester, dimethyl para toluidine
LR Gold Resin: c1.2 methacrylate ester
LR White: dimethacrylate resin, methacrylate ester, dimethyl para toluidine
LuxaBite: urethane dimethacrylate, aromatic dimethacrylate, glycol methacrylate
LuxaCore, LuxaCore Dual: urethane dimethacrylate, aliphatic dimethacrylate, aromatic dimethacrylate
Luxatemp, Luxatemp Solar, Luxatemp Fluorescence: urethane dimethacrylate, aromatic dimethacrylate, glycol methacrylate
MagicFil: aliphatic dimethacrylate, aromatic dimethacrylate, carboxylate methacrylate
Matrix Carbio adhesive: glyceroxidimethacrylate
Matrix Cabrio Catalyst: n-toluene glyline, glycidid methacrylate
Maxcem Elite: methacrylates
Maxcem Paste Products: uncured methacrylate ester monomers
MCP 15 Metal Casting Plaster, MCP 16 Metal Casting Plaster: titanium dioxide
Meliodent: methyl methacrylate
Meliodent Heat Cure Liquid: methacrylates
Meliodent Heat Cure Powder: methacrylate copolymerisates
Melioident Orthodontic Liquid: methacrylates
Metal Primer: alkyl dimethacrylate resins
Microlon Denture Resin (Liquid): inhibited methyl methacrylate, inhibited ethylene glycol dimethacrylate
Micoprime: hydroxyethyl methacrylate
Mirit: methacrylates
Modern Tenacin: zinc oxide
Modeling Resin: urethane dimethacrylate, ethoxylated bisphenol a dimethacrylate
Mucosoft Adhesive Agent: methyl methacrylate
Multi-Cal (Multi,Multi-3):calcium hydroxide
Myerson Special Crown/Bridge Opaque Powders: titanium dioxide
Natural Cure Pate/Paste Dental Composite: bisphenal a diglycidy /methacrylate
Neo Adhesive and Primer: triethyleneglycoldimethacrylate, 20hydroxyethylmethacrylate
New Outline Skin Bonding: methacryl acid ester, methylmethacrylate
New Outline Skin Bonding: methylmethacrylate xi; r 37/38
New Outline Skin Primer: 80-62-6 methyl methacrylate
New Outline Powder: acryl-resin on base of polymethylmethacrylate
New Outline Skin Primer: methylmethacrylate
New Outline Skin Glaze: methyl methacrylate, aromatic urethane acrylate
Nexxus paste products: uncured methacrylate ester monomers
Nickel or Cobalt-chrome (Base-metal) Alloys: Nickel allergies are common among women.
Niranium Alloy 1-2-3: nickel, aluminum, beryllium
Nomix Temporary Cement: d.m.t.g., ethyl methacrylate polymer, calcium sulphate, zinc oxide, triacetin, potassium sulphate
Non-Eugenol Temporary Cement: polymerizable methacrylates
NS Bond Universal Dentine Primer: hydroxyethyl methacrylate
NX3 Nexus Third Generation Paste: Products: uncured methacrylate ester monomers
Oudus stone cement, liquid: zinc oxide
One Coat Bond: hydroxyethylmethacrylate, methacrylates
One-UP Bond F Bonding Agent: methacrylates
One Step: biphenyl dimethacrylate, hydroxyethyl methacrylate
One Step Plus: biphenyl dimethacrylate, hydroxyethyl methacrylate
Opaker: uncured methacrylate ester monomers
Optibond Dual Care Paste: uncured methacrylate ester monomers, triethyleneglycol dimethacrylate
Optibond FL Adhesive Resin: uncured methacrylate ester, dimethacrylate
Optibond Light Cure Adhesive Resin: uncured methacrylate ester monomers
Optibond Dual Cure Activator Resin: uncured methacrylate
Optibond Solo: dimethacrylates
Optiguard: methacrylates
Optilon High Impact Denture Base: compounded poly methyl methacrylate
Optilon 399 High Impact Denture Resin (Liquid): inhibited methyl methacrylate, inhibited ethylene glycol dimethacrylate
Orafil-Plus: zinc oxide
Orafil-G: zinc oxide
Ortho-Choice OBA: Methacrylate resins
Ortho-Jet Tinting Concentrate: methyl methacrylate, n,n-dimethyl-p-toluidine
Ortho Loc Paste: dimethacrylate
Ortho Loc Primer: dimethacrylate, methacrylates
Paint On Color: methacrylates
Paint On Dental Dam: methacrylates
Palabond: methyl methacrylate, methylacrylic acid
Paladon 65 Liquid: methacrylates
Paladow Powder: methacrylate copolymerisates
Palador Liquid: methyl methacrylate
Paladur Powder: methacrylate copolymerisates
Palapress Vario Liquid: methyl methacrylate, ethylene dimethacrylate
Palapress Vario Powder: methacrylate copolymerisates
Palaseal: methyl methacrylate
Palavit G LC K I: triethyleneglycoldimethacrylate
Palavit G LC Modelling Liquid: triethyleneglycoldimethacrylate
Palavit 55 VS Liquid: methyl methacrylate
Parabond adhesive A: hydroxyethylmethacrylate, methacrylates
ParaBond Non Rinse Conditioner: hydroxyethylmethacrylate cas-no 868-77-9
ParaCem Universal DC (base): methacrylates
ParaCem Universal DC (catalyst): methacrylates
Paragon Denture Resin (Liquid): inhibited methyl methacrylate, inhibited ethylene glycol dimethacrylate
ParaPost Cement Base: methacrylates
ParaPost Cement Catalysts: methacrylates
ParaPost Cement Conditioner A: hydroxyethylmethacrylate, methacrylates
Pbs core EviDots in PMMA: lead sulfide, polymethyl methacrylate
“PD” chemical cure hybrid composite, base: bis-gma (bis phenol a-glycidyl methacrylate) hexanoldimethacrylate
“PD” chemical cure hybrid composite catalyst: bis-gma (bis phenol a-glycidyl methacrylate) hexanoldimethacrylate
“PD” root canal sealer: zinc oxide
“PD” tempotec: zinc oxide
PDMA Composite: polycarbonate dimethacrylate resin
Perfectemp II Temporary Cement: urethane dimethacrylate, aromatic dimethacrylate, glycol methacrylate
Perm Reline/Repair Resin (Liquid): inhibited methyl methacrylate, inhibited n,n-dimethyl-p-toluidine, inhibited ethylene glycol dimethacrylate
Permacem, Permacem Dual: aliphatic dimethacrylate, aromatic dimethacrylate, carboxylate methacrylate bisphenol a.
(bowen resin) toxic when uncured
Phthalates: (DBP Dibutyl phthalate and DOP)
PI-KU-Plast Monomer Blue: methylmethacrylate
PI-KU-Plast Monomer Orange: methylmethacrylate
PI-KU-Plast Monomer Red: methylmethacrylate
PI-KU-Plast Monomer Transparent: methylmethacrylate
PI-KU-Plast Monomer Yellow: methylmethacrylate
Point 4: uncured methacrylate ester monomers
Point 4 flowable optimized particle composite system: uncured methacrylate ester monomers
PolyCarbocatalyzed Cement powder: zinc oxide
PolyCarb Watersets: zinc oxide
Poly-F Plus: zinc oxide
**Splintline Powder:** methacrylate polymer
**Structure 2 SC:** dimethacrylates
**Successful Gutta Percha Compound:** Zinc Oxide, fd&c
**Sultan:** eugenol
**Sultan Sensi-Temp:** multifunctional methacrylates
**Supa Glue:** poly(methyl methacrylate
**Surefil (High density posterior composite):** urethane modified bis-gma dimethacrylate, polymerizable dimethacrylate resin
**Surpass 2:** Hydroxymethyl methacrylate
**Surpass 3:** Triethylene Glycol Dimethacrylate
**Suspension Polymer:** methacrylates
**Sybraloy Precapsulated:** Mercury, alloy powder contains silver, tin and copper metals
**Synergy Compact:** methacrylates
**Synergy Duo Shade:** methacrylates
**Synergy Flow:** methacrylates
**Synergy Super White:** methacrylates
**Synergy Transparent:** methacrylates
**TEGMA Composite:** triethylene glycol dimethacrylate resin
**Teethmate F-1 (Natural):** triethylene glycol dimethacrylate, methacryloyfluoride-methyl methacrylate copolymer, hydrophobic aromatic dimethacrylate
**Teco:** aromatic dimethacrylate, poly-monomer-, dimethacrylate, polycarboxyl polydimethacrylate
**TempART Acrylic Resin Powder:** methacrylate copolymer
**Tempfil Paste Products Inlay/Onlay:** uncured diacrylate ester monomers
**Temptation:** polyfunctional acrylates, methacrylates, unsaturated esters, monaloy urea derivatives
**TempCanal (PTCK,PTC):** calcium hydroxide
**Temporary Bridge Resin Liquid:** methyl methacrylate, polymerizable dimethacrylate
**Temporary Dental Stopping:** gutta percha sheets or rods, zinc oxide
**Temp Bond Base:** zinc oxide
**Temp-Bond Accelerator:** eugenol
**Temp Glaze:** methyl methacrylate
**Tempit:** urethane dimethacrylate
**TempCem NE:** zinc oxide
**TempCem, TempCem Soft:** zinc oxide, eugenol
**Tempory Bridge Liquid:** methyl methacrylate
**Temporary Dental Stopping:** zinc oxide
**Temposil Zinc Oxide:**
**Temphase Catalyst Paste:** uncured methacrylate ester monomers
**Temphase Base Paste:** uncured methacrylate monomers
**TempSpan:** bis-gma, methacrylates
**Temrex Cement Powder:** zinc oxide
**Tetrahydrofurfuryl Methacrylate:** (HQ, MEHQ, etc.)
**TimeLine VLC Baseline with dentin primer:** urethane Dimethacrylate
**Titan:** Triethylene Glycol Dimethacrylate
**TotalBond Liquid:** 2-hydroxyethyl methacrylate, 4-methacryoxyethyltrimellitic acid anhydride, diacrylate of polycondensate of bisphenol a glycidyl ether, dimethacrylate of polycondensate of bisphenol a and glycol, dimethacrylate of polycondensate of glycol
**TotalBond Powders (light,medium and dark):** copolymer of methacrylates
**TPH 3 Micro:** titanium dioxide, urethane modified bis-gma dimethacrylate, polymerizable dimethacrylate resin
**TPH Spectrum:** urethane modified bis-gma dimethacrylate, polymerizable dimethacrylate resin
**TR2 Temporary Cement:** uncured acrylate, methacrylate ester monomers
**Triethylene Glycol Dimethacrylate:** toxic when uncured
**Triphasis Alignite Tray Adhesive:** Toulene Tubs-Seal:** zinc oxide, eugenol
**Tublitee Cavity Liner:** calcium hydroxide
**Turbo Temp:** multifunctional methacrylates
**Turbo Temp 2:** multifunctional methacrylates
**Twinlook Cement Base:** methacrylates
**Twinlook Cement Cat:** methacrylates
**Tylol-Plus:** zinc oxide, polycrylic acid
**Tyrian SPE Part B:** bis 2-methacryloyloxy diethanol p-toluidine
**Tytin:** Mercury, alloy powder contains silver, tin and copper metals
**Tytin, Precapsulated:** uncured methacrylate ester monomers
**UDMA Composite:** urethane dimethacrylate resin
**Ultrafil Gutta Percha cannules:** usp zinc oxide, barium sulfate
**Unicem (relux unicem):** methacrylates, dimethacrylates
**Unicem Rely X:** methacrylates, dimethacrylates
**Universal liquid, clearfil new bond:** n,n-diethanol p-toluidine
**Universal liquid, clearfil photo bond:** n,n-diethanol p-toluidine
**Universal paste, clearfil core new bond:** bisphenol a diglycidymethacrylate, triethylene glycol dimethacrylate, n,n-diethanol-p-toluidine
**U/P Root Canal Powder:** zinc oxide
**VersaFlo:** glycol methacrylate, multifunctional methacrylates, barium glass
**Versa-Temp Temporary Crown:** methacrylates
**Vertex Castapress Liquid:** methacrylate
**Vertex Castavaria Liquid:** methacrylate
**Vertex Castavite Liquid:** methacrylates
**Vertex Impacky Cold Liquid:** methacrylates
**Vertex Self Curing Liquid:** methacrylate
**Vertex Rapid-Simplified Liquid:** methacrylate
**Vertex Regular:** methacrylate
**Vipi cril, vipi flash, vipi cor, vipi wave, stg and ortho cril-liquid:** methacrylates
**Visco-Gem Opaque Liquid:** methyl methacrylate
**Vitatex:** calcium hydroxide
**Vitique:** aliphatic dimethacrylate, aromatic dimethacrylate, carboxylic methacrylate
**Vitre-Bond:** dimethacrylates
**3RM Liquid:** zinc oxide, eugenol
**3M single bond (Ad Per):** dimethacrylates, methacrylates
**Wachs Root Canal Powder:** zinc oxide
**Xeno III:** hydroxyethyl methacrylate
**Xeno IV:** urethane dimethacrylate resin, dipentaerythritol pentaerythritol phosphate, polymerizable dimethacrylate resin
**XP Bond:** dimethacrylate resins
**XR Bond Adhesive Resin:** uncured methacrylate ester monomers alkyl dimethacrylates
**XR Bond Primer:** alkyl dimethacrylate resins
**Zical:** zinc oxide
**Zinc Oxide Powder:** zinc oxide, eugenol
**Zinocol Polymer Reinforced Zoe Cement:** zinc oxide, eugenol
**Zinocem Cement Powder:** zno
**Zircate Propy Paste:** tin oxide
**Zoe B & T Liquid:** eugenol
**Zoe B & T Powder:** zinc oxide
**2 bond 2 Base:** dodecandioldimethacrylate
**2 bond 2 Cat:** dodecandioldimethacrylate
**3C-Bond:** titanium dioxide
**50/50 Core Mix:** titanium dioxide

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References

About the Author
Dr. Amin earned his B.Sc. in Botany and Zoology and M. Sc. in Medical Entomology from Cairo University, and Ph.D. in Parasitology from Arizona State University. His professional training started at the US Naval Medical Research Unit #3 (NAMRU-3), Cairo as a Research Associate in Medical Zoology. His post-doctoral work was at Old Dominion University, Norfolk. He subsequently worked at CDC, Atlanta, 1969–1970, then at the University of Wisconsin as a Professor of Parasitology, Allied Health and Biology for 20 years. In 1992, he founded the Institute of Parasitic Diseases (IPD) (for research and clinical testing of human parasites). He has a joint laboratory facility in Mexico and Mali, West Africa as well as continued research association with NAMRU-3 in Cairo.

Dr. Amin is a nationally and internationally recognized authority in Parasitology. He specializes in the systematics, ecology and pathology of protozoans, helminths and arthropods. He has published over 185 major articles/book chapters/teaching videos on parasites from North America, Peru, Chile, North, South and East Africa, Persian Gulf, the Middle East, Taiwan, Japan, Thailand, Vietnam, Inner Mongolia (China), Russia and India. He is an active lecturer on parasitological and related disease topics to health care professional, allied health workers and medical students in seminar and workshop settings.

Dr. Amin is an active member in the American Society of Parasitologists (and its Rocky Mountain affiliate), British Society of Parasitology, Entomological Society of America, Helminthological Society of Washington, American Microscopical Society, Microbiology and Arizona Homeopathic and Integrative Medical Association.