

# Save Lives! The Miracle of Organ Donation & Subsequent Dental Considerations

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## Resources

[www.unos.org](http://www.unos.org) United Network for Organ Sharing – Non-profit organization that administers the Organ Procurement & Transplant Network (OPTN)

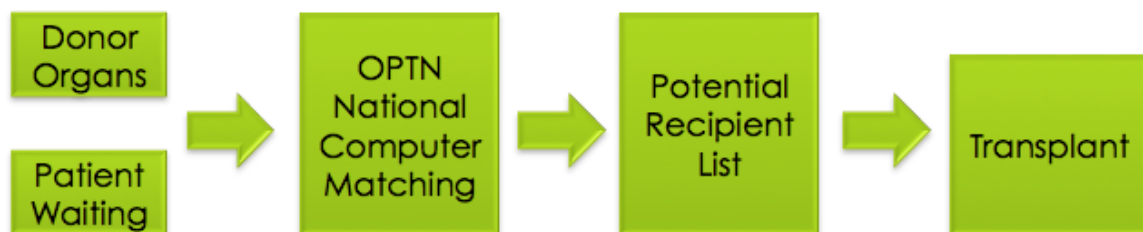
[www.optn.transplant.hrsa.gov](http://www.optn.transplant.hrsa.gov) Organ Procurement & Transplant Networks (OPTN) Web site offers a wealth of information about transplantation for donors & recipients

[www.transplantliving.org](http://www.transplantliving.org) Resource for Living Organ Donation

[www.dontatellife.net](http://www.dontatellife.net) Registration for living donations and organ donations

[www.srtr.org](http://www.srtr.org) - Scientific Registry of Transplant Recipients

## Organ Donation Process



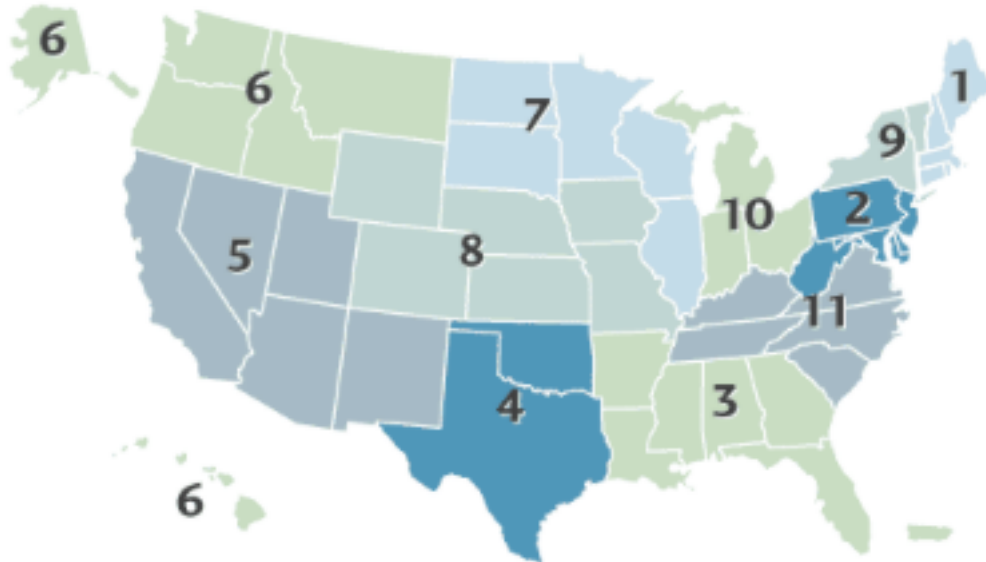
**Local Donation Service Area (58)**

**OPTN Region (11)**

**OPTN Nationally**

## ORGAN PROCUREMENT ORGANIZATIONS (OPOs)

Two main functions: 1) increasing the number of registered donors, and 2) coordinating the donation process when actual donors become available.



11 Geographic Regions of the Organ Procurement and Transplant Network  
58 Organ Procurement Organizations within the 11 Regions

## Organ Donation

All major religions in the world view organ donation as an act of charity or make it clear that it is a decision left up to the individual or family

Romani	Donation=x	Transplantation=x
Shinto	Donation= x	Transplantation= Acceptable to some
Jehovah's Witnesses	Donation=x	Transplantation=x

## Non-Living Organ Donation

- No age restrictions
- Exclusions:
  - Active cancer
  - HIV infection (Exception: Transplantation HIV+ to HIV+)
  - Systemic infection

## Blood Type Compatibility

Recipient Blood Type	Donor Blood Type(s)
A	A or O
AB (Universal Recipient)	A, AB, B or O
B	B or O
O (Universal Donor)	O

## Living Donation – [www.livingdonation.org](http://www.livingdonation.org)

- Related – blood relative
- Non-Related – spouses, in-laws, friends
- Non-Directed – Not known by recipient
- Paired Donation – 2 kidney donor/recipient pairs with incompatible blood types, but trade donors for compatibility
- NEAD – Never-ending altruistic donor chain

## Living Donation Options

- Kidney
- Lobe of a Lung
- Partial liver, pancreas or intestine
- Stem Cell / Bone marrow
- Uterus

## Considerations For Patients With Chronic Kidney Disease & End Stage Renal Disease

**Chronic Kidney Disease & Periodontal Disease** (10-20 of every 100 people on dialysis die each year)

*Sharma P, Dietrich T, Ferro CJ, Cockwell P, Chappel IAC. Association between periodontitis and mortality in stages 3 – 5 in chronic kidney disease: NHNES III and linked mortality study. Journal of Clinical Periodontology 2016;43 104-113.*

- NHANES III Study / >13,000 people / Followed 14.3 years / 6% CKD
- **Death from CKD & Periodontitis: 41%**
- Death from CKD without Periodontitis: 32%
- **Death from CKD & Periodontitis & Diabetes: 43%**
- Death from CKD & Periodontitis without Diabetes: 32%

Zhang J, Jiang H, Sun M, Chen J Association between periodontal disease and mortality in people with chronic kidney disease: A meta-analysis of cohort studies. *BMC Nephrology* 2017;18 269 *BIO MED CENTRAL OPEN ACCESS*

- Meta-Analysis of cohort studies / 8 studies / 5477 people / 1492 cases of all-cause death
- **Periodontal disease is significantly associated with an increased risk of all-cause death in people with CKD**
  - Increased inflammatory markers (CRP, Interleukin 6, Fibrinogen)
  - Circulating periodontal pathogens further exacerbating systemic inflammation
  - Increased endothelial dysfunction and vascular injury
  - Malnutrition increasing severity of periodontal disease/inflammatory burden
  - Shared influencers from smoking, diabetes and hypertension

## Dental Conditions Associated With Chronic Kidney Disease

### Anemia

- Palatal/lingual erosion due to vomiting
- Diminished salivary flow
- Candidiasis, stomatitis, glossitis
- Gingival hyperplasia
- Enamel hypoplasia
- Loss of lamina dura
- Increased risk of bone fracture with extraction

### Dental Implications For Treatment:

- Consultation with Nephrologist (Blood count & coagulation tests prior to invasive treatment)
- Eliminate any infections ASAP
- Appointment time considering dialysis, if indicated
- Monitor blood pressure during procedures
- Avoid tetracycline (Exception: Doxycycline)
- Prolong penicillin, clindamycin & cyclosporine prescriptions
- Avoid NASIDS, aspirin & opioids (renal toxicity & increased hemorrhage)
- Increased risk of bleeding for hemodialysis patients
- Increased risk of pneumonia (Caution with Air polishing devices)
- Dietary modifications
- Nutritional deficiencies

<b>Vitamin</b>	<b>Function</b>	<b>Oral Symptoms of Deficiency</b>
<b>B Vitamins</b>	<b>Energy production, DNA, RNA synthesis</b>	<b>Angular cheilitis, bald tongue, aphthous ulcers, glossitis, pale or scarlet tongue</b>
<b>Vitamin C</b>	<b>Antioxidant, iron absorption, collagen synthesis, reduction of inflammation</b>	<b>Bleeding gums, gingivitis, tooth loss</b>
<b>Iron</b>	<b>Carries oxygen, energy levels</b>	<b>Pale lips/tongue, filiform atrophy, scarlet tongue</b>
<b>Zinc</b>	<b>Immune function, wound healing, taste</b>	<b>Extraoral dermatitis, peeling lips, angular cheilitis, poor taste acuity</b>

## **Managing Oral Health While Waiting For Transplantation**

- Medications & Side Effects
- Renal Failure
- Premedication
- Oral Infection
- Excessive Bleeding
- Daily Biofilm Management
- Extract Non-Restorable Teeth
- Manage Anxiety
- Other Considerations

## **Manage Oral Health Post Transplantation**

- Avoid Treatment 3 Months Post Transplant
- Risk of Infections Increased – Check with MD for Premedication
- Slower Healing Due to Immunosuppression

- Steroids (Signs of adrenal insufficiency: hypertensive, weak, nauseated, feverish)
- Antimicrobial pre-rinse
- BP prior to treatment
- Assess bleeding potential
- Saliva substitutes & Fluorides for dry mouth
- Treat all infections aggressively
- Consult with physician for prescribing Rx

## Potential Side Effects of Immunosuppression

- Bacterial infections
- Candidiasis
- Herpes Simplex
- Hairy Leukoplakia
- Aphthous ulcers
- Progressive periodontal disease
- Delayed wound healing
- Excessive hemorrhage
- Mucositis

## World Health Organization Scale for Oral Mucositis

- Grade 0 = No oral mucositis
- Grade 1 = Erythema and soreness
- Grade 2 = Ulcers, able to eat solids
- Grade 3 = Ulcers, requires liquid diet (due to mucositis)
- Grade 4 = Ulcers, alimentation not possible (due to mucositis)

## National Cancer Institute Criteria for Adverse Events

- Grade 1 = Asymptomatic or mild symptoms; intervention not indicated.
- Grade 2 = Moderate pain; not interfering with oral intake; modified diet indicated
- Grade 3 = Severe pain; interfering with oral intake
- Grade 4 = Life-threatening consequences; urgent intervention indicated
- Grade 5 = Death

## Oral Mucositis Guidelines – Annals of Oncology 2011

- Frequent use of non-medicated oral rinses, i.e. saline rinses 4 – 6 times daily
- Avoid alcohol-based & chlorhexidine rinses
- Soft or extra soft bristle brushes (Power brush on gentle vibration)
- Pain controlled analgesia with morphine

- Screen for evidence of mal-nutrition (glossy tissue)
- OTC Topical anesthetics may provide temporary relief

## Cytomegalovirus Infection –

- Herpes virus – transmitted via saliva, urine, blood transfusions and organ transplantation
- Once infected, virus stays in body for a lifetime
- Can remain dormant, **but can reactivate especially with immunosuppression**

## Graft Versus Host Disease

- 35-55% stem cell transplantation
- Infrequent with solid organ transplantation 1% liver, 5 % small intestine
- ~75% mortality due to infections or hemorrhage due to bone marrow failures
- No standard treatment strategy
- Skin rash initial presentation / most will have oral presentation

## Sample Professional Recommendations for Oral Conditions

- Gelclair®- bioadherent oral rinse
- Rincinol®– bioadherent oral rinse with aloe vera
- NeutraSal® / Cephosol® - Rx supersaturated calcium phosphate oral rinse
- PeriActive™ - anti-inflammatory oral rinse
- Prisyne® – hydration oral rinse
- Xylimelts® – oral disc for dry mouth
- Periosciences - Topical antioxidants. Anti-inflammatory & Antibacterial
- Xylitol products – Spray, Ice Chips, All-Day spray
- Triamcinolone Rx – cream for oral ulcerations
- Magic Mouthwash Rx – oral rinse with various formulations
  - Diphenhydramine (12.5 mg per 5 mL)
  - Antacid (Maalox liquid)
  - Lidocaine 2% viscous solution
  - Mixed in equal proportions 1:1:1
- Sonicare® Gentle Mode / Oral B Braun® – Sensitive Mode
- Tess® Oral Health – Post surgery/oncology toothbrush
- Low dose laser for oral ulcerations