Primary Care RAP January 2021 Written Summary

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Intro: Less is More

Paul Simmons MD, Neda Frayha MD

Pearls:

- ❖ **Physicians must be wary when starting any new drug for a patient with**

- Less is More series (JAMA Internal Medicine Sept 2021):
    - Two expert modified Delphi panels identified a compilation of 178 different recommendations and boiled them down to 37 key strong recommendations for primary care
        - Modified Delphi panel = group consensus strategy done remotely in a systematic way
    - 400 pages of recommendations online boiled down in PC RAP!
- Recommendation #1: Avoid using medications other than metformin to achieve a hemoglobin A1C of less than 7.5% in most older adults. Moderate control is generally better,
    - If A1c < 6.5 in adults greater than 6.5, especially those with CKD3 or greater or cognitive impairment and you see meds other than metformin, feel free to peel those off and liberalize to A1c goal of 7.5 to 8.
    - Source: Choosing Wisely Geriatrics and the American Geriatric Society
- Recommendation #2: Don't use benzodiazepines or other sedative hypnotics in older adults as first choice for insomnia, agitation, or delirium
    - Particularly discourages long-term use of these medications
    - Use is justified when other modalities have failed. Sometimes they can't be avoided in the hospital to at least try short-term. Important to include in your documentation.
    - Source: Choosing Wisely Geriatrics and the American Geriatric Society
- Recommendation #3: Do not use combined estrogen-progestin products for the prevention of chronic conditions in post-menopausal women (applies to: women over the age of 60 or who are 10 years post-menopausal)

    - If they were prescribed decades ago when it was thought to prevent cardiovascular disease, then talk about tapering it off
    - Does not apply to women who were put on it for menopausal symptoms
    - Source: United States Preventive Services Task Force, the American Geriatric Society, American College of Physicians
- Recommendation #4: Patients older than 65 with dementia or cognitive impairment, avoid use of anticholinergics
    - Source: American Geriatric Society's Beers Criteria
- Recommendation #5: Patients older than 65, avoid the use of skeletal muscle relaxants
    - Does not apply to patients with a spasticity disorder (ie: post-stroke)
    - Source: American Geriatric Society's Beers Criteria
- Recommendation #6: Patients older than 65, avoid use of single or combined antidepressants. Specifically avoid tricyclics (TCA's).
    - TCA's and paroxetine can be very anticholinergic
    - Source: American Psychiatric Association, American Geriatric Society's Beers Criteria

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The Big Picture: Facing Death with Dr. BJ Miller

BJ Miller MD, Neda Frayha MD

Pearls:

- **Expand your clinical practice lens (particularly when it comes to death) to include a non-medical lens. Even with our best efforts, there are bigger forces going on that we must recognize not to internalize too much of the limitations of the medical lens.**
- **"If you hear yourself saying, there's nothing more we can do, bite your tongue or check yourself. Feeling for somebody is doing something for somebody."**

- Social cues in the West tend to deny the natural course of life through death

    - We advertise living a particular lifestyle to forestall the inevitability of death
    - We say a person has “failed treatment” when they die
- BJ Miller’s (guest and palliative care doctor) own brush with death:
    - In college he was playing on a stopped commuter train with a friend when he was electrocuted, losing both his legs and left arm below the elbow
    - Through this experience, he has went through a universal process of grieving, sense of alienation/disbelief of his own situation and acceptance
- Suffering:
    - No one has immunity to suffering, big of small. We can opt out of feeling special in suffering and instead opt in to feeling part of the rest of the world
    - Suffering actually unites us as human beings
- Honoring patients and helping their families:
    - Lean into the patient’s subjective sense of themselves to ask questions → get to know your patients beyond their diagnosis
    - See the world beyond the medical world and be the link bridging the conventions of medicine to the patient’s view
- Love as the beautiful deathbed test:
    - When you are with your patient at their deathbed (physically or metaphorically), let yourself feel the feelings they are feeling. Learn vicariously through those moments.
    - At the same time, you have to understand there is a part that you can’t experience or fully appreciate: they will have to walk alone. It is different to feel with an open-ended horizon versus dying in a matter of moments
    - Embrace the discomfort and feelings of grief → **remember that LOVE is at the heart of these feelings of grief**. By shortchanging the grief, you are also shortchanging the expansiveness of love.

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PFTs for the PCP: Part 1 and Part 2

Nirav Shah MD, Paul Simmons MD, Neda Frayha MD

Pearls:

- **In-office spirometry is a great first step to understanding undifferentiated dyspnea, followed by PFTs and referral to pulmonology.**
- **Cardiopulmonary exercise testing (CPET) is another diagnostic tool after PFTs that gives dynamic cardiac and pulmonary function information.**

- Pulmonary Function Tests (PFTs) components:
  - Spirometry- how much air gets into and out of your lungs
  - Lung volumes - how much air fits into your lung
  - Diffusion capacity - how well your lung exchanges oxygen and carbon dioxide
- When to get them?
  - Unexplained shortness of breath, cough, wheezing
- Categories of disease that PFTs help understand:
  - Obstructive lung disease (asthma, COPD)
  - Restrictive lung disease (idiopathic pulmonary fibrosis or interstitial lung diseases, scoliosis)
  - Diffusion limitations (COPD, interstitial lung disease)
- Office-based spirometry:
  - Can be done in office and they are pretty good at ruling out abnormality. However, interpretation of individual numbers (and not just the ratio) is important. If spirometry looks off then go to formal PFTs.
  - Steps:
    - 1. Hold a mouthpiece in mouth while plugging the nose
    - 2. Take normal breaths on the spirometer to get the tidal volume
    - 3. Take a big breath in and then exhale as forcefully as you can to get the forced vital capacity
    - ** You can always redo it, so there is no messing up! **
- Plethysmography:
  - Used to determine the total lung volume
  - Patient sits in a glass box so that you can calculate how much air is in the box and how much is being displaced → the residual volume is in their lungs
  - Good to let patients know they will be in a closed space if they have any issues with claustrophobia
  - Other ways to measure if they can't tolerate the glass box:

        - **Helium dilution** - patient breaths in known concentration of helium and the spirometer measures the new concentration of helium. The leftover is the residual lung volume
        - **Nitrogen washout** - similar to helium dilution in that a known concentration of nitrogen is inhaled and then exhaled. The difference is used to calculate residual lung volume
    - With lung volumes, if the FVC is lower than expected this should be a tip off that total lung volumes may also be abnormal and the patient has a restrictive lung disease
- Diffusion capacity:
    - Determined by the alveolar capillary membrane
    - Things that affect this membrane:
        - *Alveolar scarring* - idiopathic pulmonary fibrosis or interstitial lung disease
        - *Decreased alveolar volume* - emphysema leading to reduced surface area
        - *Capillary* - pulmonary hypertension because the capillary gets thickened
- Interpreting spirometry:
    - Flow-volume loops:
        - The upper half is exhalation
        - The bottom half is inhalation
        - Variability in the overall shape of the curve can help identify obstructive vs. restrictive processes as well as a variable or fixed obstruction
        - **Obstructive pattern**: looks like a scooped out chair. A more severe pattern will have a lower back to it.
        - **Restrictive pattern**: squished egg shape
    - Interpreting the numbers:
        - Look at the loops first to give you a sense for what you might be looking for
        - FEV1/FVC ratio < 70% → obstructive
            - If total lung capacity is >120% predicted (based on demographics) = obstructive (hyperinflation)
        - FEV1/FVC ratio >= 100% + total lung capacity < 80% → restrictive
- Prepping your patient for PFTs:
    - They may have lightheadedness and that's to be expected

    - Review the process with them
    - Abstain from short-acting bronchodilator 4 hours prior to the PFTs because the test may actually want to look at pre- and post-bronchodilator response
    - If they are only a daily or twice daily LABA or LAMA, hold it for 12-24 hours
- Cardiopulmonary exercise testing (CPET):
    - Useful after PFTs, cardiac echo and maybe trial of medication and still no improvement in dyspnea
    - In the test, patient exercises while being connected to device the measures oxygen consumption and CO2 production
    - Generally ordered by pulmonologist

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What's That Lab: Bilirubin

Paul Simmons MD

Pearls:

- **Bilirubin is an important breakdown product of heme metabolism.**
- **Hyperbilirubinemia can be broken down into unconjugated and conjugated, each with their own differential.**

Clinical Scenario: *We're seeing a 50 year old man for a well man examination. He hasn't been seen in about five years, and this is your first visit with this patient. He's asymptomatic. He does not smoke. He drinks alcohol about once a week, and he*

exercises every day. So kind of a dream patient, really. He takes no medications. You do notice, however, a very slight yellowish tint to his skin. You get a complete metabolic profile, and it shows a total bilirubin high at 3.2 milligrams per deciliter, but his AST, his ALT, and his alkaline phosphatase are all normal. So what could be going on in this situation, and how would you think through this problem?

- Heme metabolism and bilirubin:
    - Hemoglobin is broken down into iron, globin and heme
    - Heme is then broken down by macrophages to biliverdin
    - Biliverdin is then converted to bilirubin, which is water-soluble, so it can be excreted
    - Once bilirubin is produced, it can circulate in the plasma as either free or bound before getting to the liver
    - In the liver, hepatocytes conjugate it with another hydrophilic molecule that facilitates excretion
    - In the duodenum, bilirubin gets converted into urobilinogen by bacteria where it can be excreted in stool or reabsorbed by the gut and recycled through the liver
- Bilirubin lab reports:
    - Direct (conjugated) - because it is conjugated it can react directly with the reagent
    - Indirect (unconjugated) - because it is not conjugated, it cannot react directly with the reagent and has to be solubilized. More indirect process.
- Causes of unconjugated hyperbilirubinemia:
    - 1. Increased production
        - Hemolysis → check a CBC, peripheral sphere for blood cell dyscrasia
    - 2. Decreased uptake
        - Acute hepatitis → elevation in ALT/AST (unless severe cirrhosis)
    - 3. Decreased conjugation
        - Medication side effect → med reconciliation
        - Defect in conjugation mechanism
            - Gilbert syndrome - 5% of adult population leading to isolated asymptomatic hyperbilirubinemia
                - Genetic defect in bilirubin conjugation due to a defective glucuronyl transferase enzyme in the hepatocytes

- Causes of conjugated hyperbilirubinemia:
    - 1. Intrahepatic
        - Decreased hepatocellular function → elevation in ALT/AST
    - 2. Extrahepatic
        - Can't get it out of the liver (obstruction) → increase in alkaline phosphatase
- Causes of hyperbilirubinemia (most unconjugated) in newborns:
    - Newborns have several factors that put them at risk for hyperbilirubinemia:
        - Immature hepatocytes that are slow to conjugate bilirubin
        - More beta-glucuronidase that de-conjugates bilirubin
        - Less serum albumin to bind plasma bilirubin
        - Less bacteria in the gut to convert bilirubin to urobilinogen
    - Breastfeeding jaundice: breastfeeding increased enterohepatic circulation and decreased milk supply at the beginning can lead to hyperbilirubinemia
    - Breast milk jaundice: enzyme beta-glucuronidase in breast milk leads to more de-conjugation
    - Hemolysis from birth trauma or incompatibility with mother's blood type

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Tattoo Complications

Brittney DeClerck, MD, Matthieu DeClerck, MD, and Matthew DeLaney, MD

Pearls:

- **Up to 7% of tattoos result in a complication, most commonly acute pyogenic infections.**
- **Nontuberculous mycobacteria are the most likely pathogen in the case of a long term infection.**

- ❖ **Rarely, malignancies can arise within tattoos.**
- ❖ **A skin biopsy is necessary for all tattoo reactions (beyond a clear acute cellulitis) to determine the underlying cause and guide management.**

- **How are tattoo parlors regulated?**
  - They have limited oversight and are regulated by state and local governments.
  - 25% of tattoos occur in unregulated environments (ie. at home, in jail, etc), carrying a higher risk of infection or other complications.
  - Ink is considered to be a cosmetic agent, so it is not regulated by the FDA.
- **How frequently do tattoo reactions occur?**
  - An immediate reaction of erythema and swelling is common and resolves quickly.
  - Up to 7% of tattoos result in a diagnosable complication, usually a cutaneous eruption or reaction at the site of the tattoo.
  - The most common long term reaction is regret.
- **What is in tattoo ink?**
  - Traditionally ink was a suspension of metal salts (iron or carbon), including heavy metals, in a liquid vehicle (water, alcohol, or glycerin).
  - These compounds have been phased out in favor of less reactive and brighter azo pigments. Metals still present can include cadmium, lead, chromium, cobalt, nickel, arsenic, and mercury.
  - Red and yellow ink have the highest rates of having a reaction associated with them. Black ink is the easiest to remove.
  - The safety of the pigments is largely unknown. Interestingly, pigments are taken up by macrophages and can be found in draining lymph nodes.
- **Infectious tattoo complications:**
  - **Acute pyogenic infections**
    - Relatively common, occurring within days to weeks.
    - Usually related to bacteria introduced from the skin flora or tattoo instruments.
    - Staph aureus and strep pyogenes are common pathogens.
    - Manifests clinically with redness, swelling, pain.
    - Preventable by using sterile technique.
  - **Long term infections**
    - Non-tuberculous mycobacteria: from contaminated ink or water.
      - Most common mycobacteria = Mycobacterium chelonae.

        - Use of sterile (not distilled) water is important.
    - Fungal: rare, can be a deep fungal infections like aspergillus
    - Viral: HIV, hepatitis, HPV (warts), molluscum
    - Syphilis: historical cases of syphilis transmitted through the saliva of infected tattooists resulting in a chancre at the tattoo site.
    - These infections are slow-growing and often don't manifest for several weeks.
    - Causes robust inflammation under the skin forming papules, nodules, pustules, ulcers, abscesses, or plaques at site of tattoo.
    - Harder to diagnose, often needing a biopsy of the skin.
- **Inflammatory complications:**
    - Granulomatous reactions
    - Foreign body reactions
    - Eczematous reactions
    - Sarcoidosis
    - Lichenoid reaction
- **Neoplastic complications:**
    - While uncommon, there are certain types of cancer and cancer mimics that can occur at the site of a tattoo.
    - The proliferation of epidermis due to a reaction to the ink can mimic and be confused with a squamous cell carcinoma.
    - Pseudolymphoma may occur due to a robust inflammatory response to the tattoo.
    - Squamous cell carcinoma can occur in a tattoo, most frequently associated with red ink. Unknown mechanism.
    - Lymphoma can arise in a tattoo if a mutation occurs during the reactive inflammatory process.
- **Management**
    - Antibiotics for acute infectious complications.
    - Topical steroids for suspected local contact dermatitis (and specialist referral).

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PCOS

Rana Malek MD, Neda Frayha MD, Paul Simmons MD

Pearls:

- **For suspected PCOS, standard tests should include pregnancy test, TSH, 17 hydroxyprogesterone, prolactin level, testosterone, DHEAS, FSH.**
- **Evaluate for insulin resistance with a two-hour glucose tolerance test, not an A1c, in someone with PCOS.**
- **Start treating the symptoms that are bothering them the most - irregular periods, hyperandrogenism, fertility, depression/anxiety.**

- Polycystic ovarian syndrome:
  - Constellation of 2 out of 3:
    - 1. Menstrual irregularity
    - 2. Hyperandrogenism (biochemically or clinically)
    - 3, Presence of polycystic ovaries on ultrasound
  - Very common - 6-9% of premenopausal women
  - Complex genetic trait and environmental
    - Perhaps hyperandrogenism in utero increases risk
- Differential:
  - Thyroid dysfunction (TSH)
  - Hyperprolactinemia (prolactin level)
  - Non-classic congenital adrenal hyperplasia (17-hydroxyprogesterone level)
  - Primary ovarian insufficiency (ie: early menopause): important to recognize because you may change her chances of fertility preservation
  - Hypothalamic amenorrhea: results in hypoestrogenism that can cause issues with bone health
  - Cushing syndrome, acromegaly, any type of adrenal or ovarian tumor → usually clues on physical exam:
    - Moon facies, supraclavicular fat pads (Cushings)
    - Prognathism (acromegaly)

        - Clitoromegaly (hyperandrogenism)
        - Vaginal atrophy (estrogen deficiency)
        - Significant acanthosis nigricans beyond the neck like in axilla and pelvic area
        - Hirsutism - Ferriman-Gallwey scale to grade severity
    - Depending on your findings, you may want to order additional work-up beyond the TSH, prolactin and 17-hydroxyprogesterone level
- Other comorbidities:
    - Hyperlipidemia
    - Obesity
    - Pearl: Impaired glucose intolerance as measured by a two-hour glucose tolerance test, not an A1c
    - Sleep apnea
    - Fatty liver disease
    - Coronary heart disease
- Evaluation:
    - Pregnancy test
    - TSH
    - Prolactin
    - 17-hydroxyprogesterone
    - Testosterone levels
    - DHEAS - 30% of women with PCOS have elevated DHEAS and not testosterone
    - FSH to catch primary ovarian insufficiency
    - Fasting lipid panel
    - 2-hour oral glucose tolerance test
    - If concerned about hypercortisolism:
        - Midnight salivary cortisol or 24 hour urine collection
    - If concerned about acromegaly:
        - IGF level
    - If concerned about extreme insulin resistance syndrome:
        - Insulin levels while doing the 2-hour glucose tolerance test
    - Ultrasound - only if going to make the diagnosis!
- Treatment:
    - Start with: “What are the symptoms that are bothering you the most?”
    - Hyperandrogenism

        - Estrogen-progesterone birth control pills → estrogen helps suppress the FSH and LH, which also leads to less testosterone production in the ovaries
            - Pills take about 6 months to take effect
            - Have patients keep track of intervals between hair removal or changes in the quality of the hair that is regrown
        - Spironolactone is second-line
            - Toxic in pregnancy so women need to be on birth control or not sexually active
    - Irregular periods
        - Estrogen-progesterone birth control pills
        - Progesterone only (either continuous or intermittent)
        - Metformin because it can restore ovarian function in up to half of women with PCOS
    - Weight gain
        - Low carb diets because insulin resistance is an underlying mechanism
        - Whatever diet works for the patient is the best diet for them
        - Bariatric surgery in morbidly obese
    - Fertility
        - Metformin up to 1g twice a day
        - Ovulation induction
    - Depression and anxiety are more common, particularly with increasing weight

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Navajo Health/COVID

Matthew Nelson DO, MPH and Paul Simmons MD

Pearls:

- **COVID has followed a well-trodden path of health disparities that have impacted generations of the Navajo Nation that are exacerbated by unjust Federal policies and lack of appropriate resources to serve the needs of this community.**
- **Navajo Hopi COVID Relief Organization - check out this organization to learn more about a Native-led group that is helping with the COVID effort**

- Navajo Nation:
  - Morbidity and mortality on the reservation has always been disproportionate to the US population
    - Diabetes death 3x higher
    - Chronic liver disease death 4.5x higher
    - Influenza pneumonia death 2x higher
  - Navajo Nation land area is roughly the size of West Virginia with a population of 200,000-300,000 people that live in extended family gatherings called chapters
    - Within each group, the Navajo family practice fluid roles as auntie, uncle and grandparents caring for children and children caring for elders
- COVID and Navajo Nation:
  - Really hit late March, early April with 465/100000
  - By late April the numbers were 1427/100000 (second only to New York state)
  - The IHS clinic went into incident command that meant they were serving as a triage point diverting patients to major hubs where the resources were
  - Clinics were running out of gowns, PPE supply and masks
    - They were using 3D printed masks to address the mask shortage

- Navajo and disease construct:
    - For many of the Navajo patients, there is a strong tradition of narrating disease as a means of healing
    - People get sick when they have been thrown off balance as they must narrate wellness back into the individual
    - There is a therapeutic component to patients coming in to narrate their wellness and story of their disease that at times does not easily mesh into a 15-minute visit
- Takeaways from working with the Navajo people:
    - They exist and are graceful, hard-working, resilient, beautiful people that live in various places of this country, not just in rural landscapes.
    - There are some inherent problems with how the government as negotiated their care to a traditionally underserved and marginalized population
        - Healthcare expenditure for the Indian Health Service is still placed in discretionary funding → if you run out of funds, you are out of luck
    - Native land is held in a federal trust, meaning it is not owned. Therefore, people on the land can't accumulate wealth through land ownership and this trickles into barriers to starting a business on federal trust land.
    - There should be more partnerships between academic institutions and the native community because they are woefully underrepresented in medicine
    - Navajo Hopi COVID Relief Organization - check out this organization to learn more about a Native-led group that is helping with the COVID effort

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PAPER CHASE #1: Cardiovascular and Renal Outcomes with Empagliflozin in Heart Failure

Steve Biederman MD, Tom Robertson MD

Packer M, Anker SD, Butler J, et al; EMPEROR-Reduced Trial Investigators. Cardiovascular and Renal Outcomes with Empagliflozin in Heart Failure. N Engl J Med. 2020 Oct 8;383(15):1413-1424. doi: 10.1056/NEJMoa2022190. Epub 2020 Aug 28. PMID: 32865377.

Pearls:

- ❖ **Among patients with heart failure, SGLT inhibitors improved rate of hospitalizations and decline in renal function regardless of diabetes status.**

- **Objective:** To assess cardiovascular and renal benefits of SGLT inhibitors in patients with heart failure
- **Background:** DAPA HF trial, (NEJM 2019) found SGLT-2 inhibitor dapagliflozin reduced the risk of CHF hospitalizations, cardiovascular death among those patients with CHF regardless of the presence of diabetes

- **Method:** Industry sponsored double blind placebo controlled, randomized controlled trial to assess the effects of empagliflozin 10mg daily in patients with heart failure (EF less than 40%) with or without diabetes
    - Primary outcomes: combined primary endpoint of cardiovascular death or hospitalization due to CHF
    - Secondary outcomes: decline in their GFR
- **Results:**
    - 3700 patients with heart failure
    - Treatment group had 25% lower risk of cardiovascular death or hospitalization (NNT 19), independent of diabetes status
    - Treatment group also had a slower rate in decline of GFR
    - High rates in the empagliflozin group of uncomplicated genital tract infections about 1.3%
- **Bottomline:** Among patients with heart failure, SGLT inhibitors improved rate of hospitalizations and decline in renal function regardless of diabetes status

PAPER CHASE #2: Early Rhythm-Control Therapy in Patients with Atrial Fibrillation

Steve Biederman MD, Tom Robertson MD

Kirchhof P, Camm AJ, Goette A, et al; EAST-AFNET 4 Trial Investigators. Early Rhythm-Control Therapy in Patients with Atrial Fibrillation. N Engl J Med. 2020 Oct 1;383(14):1305-1316. doi: 10.1056/NEJMoa2019422. Epub 2020 Aug 29. PMID: 32865375.

Pearls:

- **Early rhythm control therapy was associated with a lower risk of adverse cardiovascular outcomes than usual care among patients with early atrial fibrillation and cardiovascular conditions.**

- **Objective:** To assess outcomes with rhythm control for atrial fibrillation in patients diagnosed within the past year with atrial fibrillation and who also had cardiovascular conditions
- **Method:** International parallel group, open blinded outcome assessment trial randomizing patients to either early rhythm control (med or ablation) or usual care

    - Primary outcome: composite of death from cardiovascular causes, strokes, hospitalizations with ACS or heart failure
    - Secondary outcome: nights spent in the hospital per year
- **Results:**
    - 3000 patients (either >75 or >65 with cardiovascular risk factors)
    - Composite primary outcomes occurring 3.9 per 100 person years in the rhythm control group compared to 5 per 100 person years in the rate control group
    - Followed for median 5.1 years
    - Serious adverse events only occurred in 5% of the rhythm control group
- **Bottomline:** Early rhythm control therapy was associated with a lower risk of adverse cardiovascular outcomes than usual care among patients with early atrial fibrillation and cardiovascular conditions

PAPER CHASE #3: Effects of Time-Restricted Eating on Weight Loss and Other Metabolic Parameters in Women and Men with Overweight and Obesity: The TREAT trial

Steve Biederman MD, Tom Robertson MD

Lowe DA, Wu N, Rohdin-Bibby L, et al. Effects of Time-Restricted Eating on Weight Loss and Other Metabolic Parameters in Women and Men With Overweight and Obesity: The TREAT Randomized Clinical Trial. JAMA Intern Med. 2020 Sep 28;180(11):1–9. doi: 10.1001/jamainternmed.2020.4153. Epub ahead of print. Erratum in: doi: 10.1001/jamainternmed.2020.6728. PMID: 32986097; PMCID: PMC7522780.

Pearls:

- ❖ **Time-restricted eating on its own is not more effective in weight loss than eating throughout the day.**

- **Objective:** To determine the effect of 16:8-hour time-restricted eating on weight loss and metabolic risk markers.
- **Background:** Intermittent fasting is becoming a more and more popular weight loss strategy
- **Method:** Randomized participants who were overweight or obese to either tiem-restricted eating or three meals a day. No recommendations were regarding

caloric intake or physical activity. Followed for 12 weeks and assessed mean weight loss.
    - Secondary outcomes: lipids, glucose and other health markers
- **Results:**
    - 100 participants
    - No significant difference between groups. Both had lost about 1kg of weight. No difference in metabolic profiles.
- **Bottomline:** Time-restricted eating on its own is not more effective in weight loss than eating throughout the day.

PAPER CHASE #4: Accuracy of Physicians' Electrocardiogram Interpretations - A systematic review and meta-analysis

Steve Biederman MD, Tom Robertson MD

Cook DA, Oh SY, Pusic MV. Accuracy of Physicians' Electrocardiogram Interpretations: A Systematic Review and Meta-analysis. JAMA Intern Med. 2020 Sep 28;180(11):1–11. doi: 10.1001/jamainternmed.2020.3989. Epub ahead of print. PMID: 32986084; PMCID: PMC7522782.

Pearls:

❖ **Physicians at all training levels had deficiencies in EKG interpretation, even after education interventions.**

- **Objective:** To identify and summarize published research on the accuracy of physicians' EKG interpretations
- **Method:** meta analysis of studies that assessed the accuracy of physicians or medical students, EKG interpretations in a test setting
- **Results:**
    - 78 studies that included 26 randomized control trials
    - Median accuracy was 54% and then 67% after training
    - For practicing physicians, accuracy was 69% pre-education and 80% post-education
    - For cardiologists, accuracy was 75% pre-education and 88% post-education
    - No difference based on complexity of diagnosis
- **Bottomline:** Physicians at all training levels had deficiencies in EKG interpretation, even after education interventions

PAPER CHASE #5: Fecal Microbiota Transplant is Highly Effective in Real-World Practice: Initial Results from the FMT National Registry

Steve Biederman MD, Tom Robertson MD

Kelly CR, Yen EF, Grinspan AM, et al. Fecal Microbiota Transplant is Highly Effective in Real-World Practice: Initial Results from the FMT National Registry. Gastroenterology. 2020 Sep 30:S0016-5085(20)35221-5. doi: 10.1053/j.gastro.2020.09.038. Epub ahead of print. PMID: 33011173.

Pearls:

- ❖ **Among patients with recurrent CDI treatment with FMT, cure rates were high with minimal adverse effects.**

- **Objective:** To assess the efficacy and safety of FMT for recurrent c-diff infection (CDI)
- **Method:** Analysis of the North American FMT registry, an ongoing prospective multicenter registry of patients receiving FMT since 2017. Patients were followed for two years following their transplant
    - Primary outcome: cure rate of CDI at one month after FMT
    - Cure = resolution of diarrhea and no further CDI therapy needed
    - Secondary outcome: safety symptoms, hospitalizations
- **Results:**
    - 220 participants, only 112 were able to followed
    - 1-month cure rate 90%
    - 6-month cure rate 86%
    - Most common symptoms after fecal transplant were abdominal pain, bloating and constipation → only occurred in 2% of cases
- **Bottomline:** Among patients with recurrent CDI treatment with FMT, cure rates were high with minimal adverse effects.