a DEN rat model. METHODS/STUDY POPULATION: Liver fibrotic changes were induced in 34 Wistar male rats by oral administration of Diethylnitrosamine (DEN) for 12 weeks. 22 rats were imaged with B-mode ultrasound at 3 different time points (baseline, 10 weeks and 13 weeks) for monitoring liver texture changes. Texture features studied included tissue echointensity (liver brightness normalized to kidney brightness) and tissue heterogeneity. 12 rats were imaged with photoacoustic imaging at 4 time points (baseline, 5 wks, 10 wks, and 13 wks) to look at changes in tissue oxygenation. Hemoglobin oxygen saturation (sO2A) and hemoglobin concentration (HbT) in the right and left lobes of the liver were measured. 8 rats were used as controls. Liver tissue samples were obtained following 13 weeks from DEN start time for METAIR histopathology staging of fibrosis. RESULTS/APERITED RESULTS: Texture features showed an increase with time in DEN rats. Normalized echointensity increased from 0.28 ± 0.06 at baseline to 0.46 ± 0.10 at 10 weeks (p < 0.0005) and 0.53 ± 0.15 at 13 weeks in DEN rats (p < 0.0005). In the control rats, echointensity remained at an average of 0.25 ± 0.05 (p = 0.31). Tissue heterogeneity increased over time in the DEN-exposed rats from a baseline of 208.7 ± 58.3 to 344.6 ± 52.9 at 10 weeks (p < 0.0005) and 376.8 ± 54.9 at 13 weeks (p = 0.06) however it stayed constant at 225.7 ± 37.6 in control rats (p = 0.58). The quantitative analyses of the photoacoustic signals showed that blood oxygen saturation significantly increased with time. At 5 weeks sO2AvT increased by 53.83 % (± 0.25), and HbT by 35.31 % (± 0.07). Following 10 weeks of DEN; sO2AvT by 92.04 % (± 0.29), and HbT by 55.24 % (± 0.1). All increases were significant p < 0.05. In the 13th week, however, the values of all of these parameters were lower than those in the 10th week, however, the decrease was statistically insignificant. DISCUSSION/SIGNIFICANCE OF IMPACT: Quantitative features from B-mode ultrasound and photoacoustic imaging consistently increased over time corresponding to hepatic damage, inflammation and fibrosis progressed. The use of this hybrid imaging method in clinical practice can help meet the significant need for noninvasive assessment of liver fibrosis.

Personalizing Care For Colorectal Cancer: Identifying Novel Opportunities
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OBJECTIVES/GOALS: This project seeks to understand how personalized medicine can optimize care for patients with colorectal cancer. It identifies opportunities for personalized medicine to improve clinical outcomes, and uses cost-effectiveness analysis to assess the clinical and financial impact of this approach. METHODS/STUDY POPULATION: This project uses two methods to understand the impact of personalized medicine. First, this project has used SEER-Medicare data in conjunction with Clinical Pharmacogenetics Implementation Consortium guidelines to identify medications used by patients with colorectal cancer that can be impacted by genetic variants. This data will then be combined with population genetic variant rates to understand the likely impact screening for a given variant will have on medication response and adverse events. Medication use frequencies and genetic variant rates are then used to populate cost-effectiveness models that simulate the clinical and financial outcomes, identifying optimal genes to screen. RESULTS/APERITED RESULTS: The first result will be a comprehensive overview of treatment patterns for patients with colorectal cancer in the United States, as well as the treatments used for disease-induced comorbidities. The second result will be the identification of genetic variants based on population rates and medication utilization that should be screened in this patient population. The final result will be a breakdown of the clinical and financial outcomes associated with implementing screening for the identified genes. Preliminary results from a two-gene cost-effectiveness analysis demonstrates that screening for variants in those genes improves both clinical and financial outcomes. DISCUSSION/SIGNIFICANCE OF IMPACT: This project demonstrates how current treatment approaches can be optimized via personalized medicine. It uses epidemiological methods to identify opportunities to integrate genetic findings from other diseases, and uses cost-
OBJECTIVES/GOALS: There is an imperative need to initiate translational genetic studies of hidradenitis suppurativa (HS). Such work requires large cohorts and no HS registries exist. Precision medicine initiatives provide new resources and methods for efficiently constructing cohorts, but empirically informed best practice guidelines are needed. METHODS/STUDY POPULATION: Traditional methods for building cohorts rely on clinical encounters to identify patients and collect phenotype data. Precision medicine initiatives aim to decrease the time and cost of data collection by using alternative sources, including electronic health records (EHR) and remote collection of patient-reported data. The public’s use of the Internet to obtain and exchange health-related information coupled with the success of direct-to-consumer genetic companies suggests that it is feasible to remotely ascertain research participants for genetic studies. Importantly, Internet cohorts provide an opportunity to include research participants who are disconnected from healthcare, and thus remain hidden from research that relies on EHR or clinical services. RESULTS/ANTICIPATED RESULTS: First, to conduct studies in EHR we are developing an analytic pipeline for the automated extraction of an accurate HS diagnosis using natural language processing of clinical notes. In our preliminary work we are also using ICD codes to build cohorts in two EHR systems with and without linked genetic data. Second, we have developed Internet advertising campaigns for symptom-based recruitment. Informed consent and patient-reported data is collected on-line through a series of short surveys. Patients who complete the surveys and express interest in participating in genetic studies are sent saliva collection kits and return mailing material. Finally, we have established an HS biobank that has DNA from 300 participants identified through clinical services. Enrollment is on-going. DISCUSSION/SIGNIFICANCE OF IMPACT: Our goal is to assemble an HS cohort that is large enough to power genetic discoveries. Our work is generating empirical evidence for precision medicine guidelines and will improve our knowledge about HS. The methods we are developing can be applied to efficiently create new cohorts for genetic studies of other diseases across different clinical areas.