Sports Photography Basics

What I've learned shooting high school sports

TL;DR: Just Want to Shoot?

Set your camera to Shutter Priority (Tv on Canon, S on Nikon/Sony), 1/800, Auto ISO. Set focus to continuous (AF-C on Nikon/Sony, AI Servo on Canon). Go shoot.

For what it's worth, I don't actually shoot this way. I grew up on Aperture Priority and my gear lets me set minimum shutter speed (1/1250) and max ISO (20,000) in the Auto ISO menu. If your camera can do it, give it a whirl, but there's a learning curve to shooting this way. The settings above will get you shooting today.

I'm going to tell you what took me a while to figure out. Sports photography isn't just pointing the camera at the field and hitting the shutter. I mean, it is, at a fundamental level, but it isn't.

I've spent most of the last 3 years covering sports at Herndon High School. I started with volleyball, with a smattering of football and soccer, then moved onto track. Now I try to make it to a couple of each team's home games and otherwise travel to cover the track team. My daughter runs track. That sport gets highest priority.

The goal of this guide is to get you from "why are all my photos blurry" to "I got some shots I'm proud of" without the months of frustration I went through.

The Three Settings That Matter

Every camera has 3 settings for you to use to try and nail the perfect pictures. Those dials, aperture, ISO, and shutter speed, are directly related. In Photo 1 they call it the "exposure triangle". I learned to shoot in the film days. The first setting, ISO, was constant until you were done with the roll, and you worked with the other two depending on your goal for the pic.

Basically it goes like this. Shutter speed and aperture are inversely related. Want to double the amount of light you let in? Change your f-stop from f/4 to f/2.8. Now you can use a shutter speed that's twice as fast, 1/800 -> 1/1600.

That third setting, ISO, controls light sensitivity in exchange for image quality. ISO 64? Super low sensitivity, outdoor full sun shots. ISO 20,000? What I use at night on the football field to cover the night games. As to the image quality, in the black and white old days they used larger film particles to make the film more sensitive. ISO 3200 film had large silver particles making it more sensitive, ISO 64 had tiny particles making the texture smooth and creamy. Digital does basically the same thing. You'll get grain, which is digital noise, at higher ISOs, and the grade of sensor (consumer, prosumer, pro) indicates how high the ISO top end runs.

Shutter Speed: Stopping Fast Balls for Fun and for Profit

Shutter speed controls how long light hits your camera sensor for. The bigger the number after the 1/ (like 1/1250 vs 1/500), the faster the shutter, the better chance at freezing action. As a general camera rule, you

want the shutter speed at or faster than your focal length to eliminate camera shake from pressing the shutter too hard. The smaller that fraction is and going up to whole numbers, the longer it's open. At 1s (1/1), if the camera is on a tripod, motion becomes a blur. If you're holding it, everything is blurry.

Look, you can get every other setting right, hit the shutter at the peak moment, and do everything right, but if the shutter speed is too slow, the picture is toast. Motion blur isn't something you can fix in post. New AI tools might help something on the edge, but if you smear the data, there's nothing to be recovered.

For most sports you want 1/800. If you have to, 1/500, but you'll miss more than you get. I shoot at 1/1250 all the time with my gear. With my old kit I was team 1/800. If you start hitting the speed edge and can't go faster you need to add light either through aperture or higher ISO. The grain tradeoff is worth it. You can fix grain in post.

Shutter Speed	Which sports	What you finally froze
1/250	Bench shots, timeouts, coaches	You'll mostly freeze a walking person or a head turn. Good enough for the stands
1/500	Golf follow-through (but not the drive), slower wrestling moments	Bodies are sharp but fast arms and legs will smear
1/800	Most sports if you have to. Basketball, soccer, volleyball	The body is sharp, tips of fingers and feet may still be blurry
1/1000	Football, lacrosse, track sprints	Clean freezes on most action. Sand in the jump pits may still blur
1/1250	Fast volleyball spikes, wrestling takedowns, golf drives, any explosive movement	Everything sharp. Jump pit sand is finally frozen. Where I live with my current gear
1/8000	When you have light to burn	Football's varsity kicker (#4, go Quick!)'s toes are finally frozen
1/64000	You have a pro body that can push ISO past 30k to bring the daylight	The varsity pitcher's fastball, clear enough to count the stitching on the ball

Aperture: Gateway to Light and the Path to Pop

Aperture is the size of the opening in your lens. It's measured in f-stops, and it's not straight forward, but just think of aperture (that f number) as the size of the opening in your lens. Small number like f/2.8 means the opening is big, so more light gets to the sensor. Big number like f/22 means the opening is small, so less light gets to the sensor.

It's kinda like shutter speed in the same way: 1/125 is letting in more light than 1/1250. With aperture, it's the same idea: bigger f/xx number = less light.

And if you go up or down by 1 number (f/2 to f/2.8) you double or half the amount of light hitting the sensor.

For sports, you generally want your aperture as wide as your lens allows. If your camera came with a lens (they call those kit lenses) that goes to f/5.6 at the long end, that's where you'll live. If you have a 70-200 f/2.8, you've got more flexibility, but those cost as much as a new MacBook Pro, so don't worry about that yet.

Aperture also affects something called depth of field. Your depth of field is what's in focus in front of and behind the thing you're trying to take a picture of. Wide apertures (low f-numbers) blur the background, which usually looks good in sports and gives you that subject separation where the athlete pops on the background.

Most pro photographers shoot wide open. But there's a downside: the amount of wiggle room for "is my subject in focus" gets smaller and smaller the wider you go. On a 50mm f/1.4 you can focus on someone's nose and their eyes will be out of focus. Even at f/2.8 you'll occasionally catch a football helmet grid in focus while the eyes inside the helmet are blurred.

Aperture	What's in focus	What's out of focus	When you'd use it
f/1.4	Subject's nose	Everything else, possibly even their eyes	You probably don't unless you want a cool shot of a golf ball at the edge of the cup about to drop in with nothing else in focus
f/2.8	Subject's face	Background, anyone a few feet in front or behind	Indoor sports when you need all the light you can get. Portraits with nice background blur
f/4	Subject and someone right next to them	Background still blurry, foreground too	Good balance for sports. Easier to nail focus than f/2.8
f/5.6	A few feet of depth	Background softened but readable	Where most kit lenses live at the long end. Totally workable
f/8	Several feet front to back	Background starting to sharpen up	Outdoor daylight sports. Huddles, group shots
f/11	Most of the field	Very little	Really big group shots, the entire field/court, possibly including spectators
f/22	Everything from 3 feet to infinity	Nothing	You don't unless you're shooting a daytime shot of the full stadium with a wide angle lens for a poster and need everything sharp

I talked to a kid at a basketball game shooting with an 85mm f/1.8. He told me he had to keep it at f/4 or all his shots were blurry. He figured out through experience that wide open on a moving target with a lens that was really for portrait work means a razor-thin focus margin and lots of missed shots. Just because you can f/1.4 doesn't always mean you should f/1.4. Sometimes getting the shot at f/4 with some grain is better than not getting it at all.

Remember, you may just be starting out. Don't feel bad about shooting f/4 or f/5.6 even if your lens can open wider. Give yourself some margin for error. As your focus tracking improves, you earn the right to shoot wider.

ISO: The Volume Knob for Light

Downside to shooting at f/5.6 or f/8 or even higher? You need more light.

In the dinosaur days when your parents shot film (or maybe even you, good on you for learning new things), you bought film that had a specific ISO rating. For all 24 or 36 shots, you were stuck with that ISO. With digital cameras, that's gone. You can change your ISO whenever you feel like it (or need to), or even put the camera on Auto ISO and forget about it. (Also, 36 whole shots? Pffft, that's 1.8 seconds on the shutter for my camera.)

ISO controls how sensitive your sensor is. Higher ISO = brighter image but more grain (digital noise). Lower ISO = cleaner image but darker.

One thing to remember, **grain is fixable, blur is not**. A grainy sharp photo beats a clean blurry one every single time. Modern cameras, even entry-level ones from the last few years, handle ISO 3200-6400 reasonably

well. Push it if you need to.

Indoor gyms are where this gets painful. The lighting is usually terrible, dim, uneven, sometimes flickery. You'll crank ISO higher than you want and the photos won't look as clean as you'd like. That's just how it is. Pros deal with this too; they just have cameras that handle high ISO better.

If you're shooting players in white jerseys and the white starts looking dark or muddy, you're at the edge of what your camera can do. If your camera is already at max ISO, you're wide open, and you're sitting at 1/500, you're out of room. I mean, it is a triangle right? At max ISO and wide open, the only dial you have left is dropping the shutter, which works for other photo genres, but not sports.

One trick if you're on a variable aperture kit lens: zoom out a bit. A lot of those lenses are f/5.6 at the long end but f/4 or f/4.5 when you're wider. That's almost a full stop of light back. You'll need to manually open up the aperture after you zoom, it won't happen automatically. Crop in post if you need to. A cropped sharp image beats a full-frame muddy one.

> **The priority order for sports: shutter speed first, aperture second, ISO third. Protect your shutter speed at all costs.**

Blur: Is It Motion or Is It Focus?

Sometimes the pics I thought were blurry because of motion from too slow a shutter speed weren't. The pics were just slightly out of focus. Out of focus looks out of focus when you're first starting out. After some practice you'll be able to spot a focus miss versus motion blur.

Here's how I check. Zoom in to 100% and look around the image. Is anything sharp? If everything is uniformly blurry there's a good chance it's a focus issue. If the background is in focus or the foreground, it's a focus miss. Your camera decided that the patch of turf 6' in front of you or that dude in the background that's super sharp is what you were trying to take a pic of.

If everything is out of focus but there's a direction to the blur and it looks smeared? That's motion blur caused by a shutter speed that's too slow.

Focus Sports Mode

Your camera has different focus modes. For sports, you need continuous autofocus. On Nikon it's called AF-C. On Canon it's AI Servo. On Sony it's AF-C. Whatever your camera calls it, find it and use it.

What this does: instead of locking focus once and stopping, the camera keeps adjusting focus as your subject moves. Without this, you'll focus on a player, they'll take two steps, and they'll be out of focus by the time you shoot.

That said, because your camera is constantly focusing, if another player comes tearing through your frame, there's a good chance the camera is going to pick him and refocus. Keep that in mind when you're shooting things with lots of lateral motion or sudden changes. If you're shooting track head-on, this is mostly an issue with hurdlers. The camera will decide, hey, I don't want to focus on her. She's 3 seconds ahead of the pack. You know what would look good? The word 'Herndon' across the front of that hurdle. Let's pick that and hose Karl's shot.

The single-shot focus mode (AF-S, One-Shot) is for portraits and still subjects. You can technically use it for sports, just remember to let go of the shutter and half press it repeatedly to get the camera to refocus. It's far less painful to just watch the game at that point.

Where You Point Matters

Your camera also lets you choose which part of the frame it tries to focus on. The "let the camera decide what's important" mode is usually wrong and locks on the ref, a goalpost, someone in the background, whatever. For sports, use either a single point or a small zone/group, and I usually try to keep it on the athlete's jersey number. That's easier to track than the ball or their face, and you can make the box big enough to fit them entirely in to make it even easier.

With the gear I'm using right now, I've changed my habits a little. I now use zone with eye tracking and keep the box on their upper body/head. The camera can lock on the eye and then I just need to keep the head in the box.

Back-Button Focus

We may as well start a Nikon vs Canon fight while we're at it. Back-button focus is a strong personal opinion. I started using it around the same time that I started shooting sports. I additionally disable focus on the shutter. This separates the action and my thumb just keeps the focus pressed all the time, but if there's a situation where I know someone will get between me and the subject, I can release the back button, the camera stops focusing, and I can still use the shutter without it refocusing on the new guy.

By default, half-pressing the shutter button does two things: focuses and meters. Back-button focus separates these. You assign focus to a button on the back of the camera (usually labeled AF-ON or AE-L/AF-L) and the shutter button only takes the photo.

Why bother? Let's say you're shooting baseball and you want to pre-focus on home plate. With default settings, every time you half-press to shoot, the camera refocuses on whatever's under your focus point. Maybe the umpire, maybe the dirt. With back-button focus, you focus once on the plate, then shoot when the action happens without the camera hunting.

Most cameras can do this, even entry-level ones, but how to set it up isn't always obvious. It's usually buried in a custom controls menu somewhere. Look up "back button focus [your camera model]" on YouTube and someone will walk you through it.

It takes about a week to get used to. Your thumb will forget to press the button. Then it becomes second nature and you won't go back. As a note: if you go as far as disabling focus-on-shutter like I do, you make your camera nearly impossible to use to anyone that doesn't know about it.

What "Sharp" Actually Means

When I cull a shoot and sift the pics into the kill, maybe, team, and my insta piles, I have a test that I use when sharpness really matters: can I count the eyelashes? If I zoom to 100% on a face and the eyelashes are individually defined, the image is sharp. If they're a mushy blur, something went wrong.

Being tack sharp doesn't always matter. A wide shot of a running back breaking through the line doesn't need eyelash-sharp focus. The emotion and action carry it. A tight shot of a wrestler's face after a match? Eyelash sharp for me.

Learning which is which is part of the fun. Early on I threw away shots that were "soft" but actually would have been fine for their purpose. I also kept shots that were technically sharp but boring. You'll develop your own sense of this over time.

> **Technical perfection serves the story. Not the other way around.**

Position and Timing

You can nail your settings and your focus and still get mediocre photos because you were standing in the wrong place or pressed the shutter at the wrong moment. It's annoying as hell sometimes but it comes with the territory.

Get Low

You want your photos to make the athletes look big and powerful. Shooting from standing height makes athletes look normal. Dropping to knee height or lower changes the angle and makes them look bigger. It's a basic perspective trick, but it's also the easiest, no-cost improvement you can make. Bring knee pads if you need to, I'll fold up a hoodie and use that if I'ts cold enough. I've spent entire games on one knee.

But stay mobile. Don't plant yourself. I've had to roll backwards to keep from becoming part of a football play. I've been hit by soccer balls. You're on the edge of the action, and sometimes the action comes to you faster than you expect. Keep your head up between shots and be ready to move.

Face the Action

For most sports I'd say you want to see faces and balls, not backs (soccer players allow for the odd exception by loving and asking me for back shots). For most sports, this means positioning yourself at the ends of the field/court rather than the sidelines. Think about where the players will be looking when the key moments happen, and put yourself in front of that.

Anticipation

There's a delay between your brain seeing the action, telling your finger to press the button, and then the camera's shutter lag on top of that. If you wait to see the peak moment, you've already missed it.

Take the time to learn the sport well enough to know what's going on. I have a bad habit of learning the sport while I shoot. Save yourself some pain. In basketball, watch for when a player gathers to shoot. In football, follow the quarterback's eyes. In wrestling, learn what a setup looks like before a takedown. Press the shutter *before* the moment you want.

This is why shooting a sport you understand is easier than one you don't. If you're new to a sport, watch a quarter/period/half without shooting. Just observe patterns. Then start shooting.

Also, my shots later in the season are always better than my first game shots. It's all repetition. You can make it easier or harder on yourself by picking which games you practice at. Freshman games are easier to get good sharp shots than varsity. Similarly, girls games are generally easier to practice on than boys because the game speed is a little slower.

I shot girls volleyball because my daughters played. Volleyball is a hard sport to photograph because of the speed. I'd use the freshman game to get into the zone and warm up. The JV game is faster and helps my twitch

response. By the time the varsity game started, I was primed and ready to roll. Use the levels to your advantage.

Sport-by-Sport Notes

Every sport has its thing. Let me share some of my pain:

Wrestling

Get on the mat. As low as possible. I want my lens a few hairs above the surface of the mat. Sometimes if you sit just off the mat, it gives the camera body space to occupy so you can get the lens even closer.

If I'm not doing that, I'm about a foot off the mat with the camera propped on my bag or something for stability. But you have to be quick. There's not much time between the pin and the arm-in-the-air shot from the ref.

Also: listen to the sounds of the crowd around you. They're part of the meet too. They'll tell you when something's about to happen before you see it.

Track & Field

Cross Country: Look at the course map ahead of time. Pick a spot where they'll pass you once or twice. A loop, a turn, or maybe position yourself in the middle where the course goes in front of you and comes back behind you. If you have light gear and want to chase the pack, go for it. My gear is big and heavy.

Sprints: Block starts, in the curves, or finish lines.

Hurdles: Either at the finish so they run toward you for that head-on shot, or set up at a hurdle for the side jump shot, or something in between.

Jumpers (long/triple): Down by the sand so they run toward you, or at the spot where they start the jump by the DQ boards.

Pole Vault: Three spots work well:

- Behind them, because they'll face back when they're upside down
- On the other side of the vault so they're running toward you
- Crouching low at the vault bar, aimed up, so you get them in the air

Careful with that last one. I've been hit by the poles there. There's a ding and permanent scuff on my 24-70 from my last districts meet.

Field Events (shot put, discus): You need a long lens (300mm+) to keep from getting hit. I like to stand straight downrange of the throwers. **DO NOT PLANT YOURSELF.** They're throwing metal things at you. Be ready to move.

The 20-Heat Invitational:

Old school: print the heat sheet, highlight your runners ahead of time, pay attention to heat/lane assignments.

Newer school: MileStat/MileSplit updates automatically. I have my phone attached to my monopod and the page refreshes so I know which lane we're in.

Keep extra batteries in your pockets and a water bottle next to you (and snacks if snacks is your thing, you won't be back to your bag anytime soon).

Football

You're only allowed in certain spots. If I'm chasing possession, I set up at the opposite end zone and let them come to me. Vice versa if I'm covering the defensive team.

The hard spot is when the play is in the middle of the field. I do what I can from there.

I try to follow the ball on offense. When we're on defense, I focus on getting good shots of our defenders.

Basketball

I start under the basket but about 10 feet back, at ground level. Then I move to a corner on the visitors' side. Switch sides at the half.

I don't shoot from the middle much.

Volleyball

I sit at the net for most of the game, either on the ground or up at the top of the bleachers so I'm at net level.

For serve shots, I'll move back to the serving line and get side profiles.

If I have long glass with me (300mm+), I'll shoot from the opposite end and try to get the blocks and serves (if they jump high enough to clear the net).

Soccer, Lacrosse, Field Hockey (and similar)

Usually I'm around the home third of the field for defense/goalie shots, then switch to the other third for offense/shots on goal.

Technically you're not allowed behind the goal or in the corners, but with a long enough lens (400mm) you can shoot from back there without interfering with anything.

Lighting Notes

We're lucky that HHS has decent lighting. If you're at a gym that's not ours, learn to use a gray card (or a piece of white paper). Take a picture of it so you can tell Lightroom what white is and it will adjust your white balance accordingly.

If you notice that sometimes some of your frames are inconsistently dark and you're using burst on your camera, especially with higher shutter speeds, you may be catching the gym lights flickering that our eyes can't see. Dig through the camera menu, you might have an anti-flicker setting.

Gear: No, You Don't Need That Big Ass Lens

(Pro tip: It's going to be stupid heavy)

I shoot with professional-grade bodies and glass, but I didn't start there. You don't need to either. Only a couple things really matter when you're getting started:

Reach

You need a lens that gets you close to the action. But it's not one lens fit all because fields, courts, tracks, are all different sizes. For most of the high school sports, I shoot from the sidelines. I'm usually using something around 200mm, sometimes 300mm, for football 400mm. My 70-200mm f/2.8 lens is my workhorse. I always have that lens on me. It's also expensive and should be something future you looks into.

For a lot of entry-level sports photographers a decent 70-300mm lens, either camera brand or third party, will be your best bang for your buck. It won't be as sharp as my 70-200 f/2.8, or nearly as fast/tack sharp as a $12,000 400mm f/2.8, but it'll get you in the game. And remember, you're just trying to get in the game. That 400mm is "I work for ESPN and they hand me gear to take pictures with" territory.

And don't forget, lens length isn't the only way to get reach. If you can get closer, get closer. Ten yards of walking is a lot cheaper than 100mm of glass.

Solid Autofocus

Your camera needs to track moving subjects. Any DSLR or mirrorless from the last 5-6 years can do this just fine. My 15 year old Nikon DSLR stuggles a little but I can still make it work. Generally older cameras and/or phones will struggle. If your camera is hunting for focus and missing constantly, that's a real limitation. But with practice, it's still usable. People took amazing sports pics on film (36 shots!) with manual focus cameras. Your parent's 15-year-old DSLR is still better than the all-manual Minolta X700 I used to cover games with for the school paper in high school.

Frames Per Second

Continuous shooting (burst mode) helps you catch peak action. 1-3 can work with practice. 3-6 frames per second is workable. 10+ is better. My camera can shoot 20 fps, but I usually keep it at 10 or 5. Sometimes I put it in single frame mode. It depends on the sport and the context.

Hold up. Don't toss your low FPS camera thinking it won't cut it. I'll admit, it's nice to be able to shoot fast, but if I'm tracking a football player and holding the shutter down while he runs towards me, past me, and beyond me at 20 fps, I may have just taken 100-200 pictures. Not only is that going to burn through my camera's memory card, but I'll have to review them all later to get the 3-4 pics I want out of that burst.

FPS definitely helps, but it's not the end-all. I shot 6,800 frames in just under 2 hours covering a gymnastics meet recently. Floor, vault, bars, beam routines all moving fast enough that I needed the speed to get the peak shots. But that's 6,800 frames I had to cull afterwards. It took me 2 hours to go through everything. That's the tradeoff.

A famous old photographer named Henri Cartier-Bresson captured decisive moments with an all manual point and shoot film camera that shot one frame at a time. Don't let low FPS stop you.

ISO Performance

This is where the gear you have and how old it is makes any difference. Newer sensors handle high ISO better. If you're shooting in a dim gym with an older camera, you'll fight the grain. It's workable, but be realistic about the limitations.

Buy Used

Camera gear depreciates fast but lasts forever if treated well. A 5-year-old professional body often outperforms a new entry-level one and costs the same.

With the exception of one mirrorless lens where the used price was only $25 less than new, everything I own I bought used from MPB, B&H;, or Adorama at a significant discount. The only things I would never buy used are the consumables: batteries and flash cards.

Being There Without Being There

The video guys and fanboys will argue about this endlessly, and I'm old enough to not care what they think. But to me, coverage means I'm there to document, not to create some heavily edited masterpiece. I'm not the story. The athletes are.

When I'm working, I'm quiet. I listen to my music. I try to stay out of everyone's way. I feel like if an official, a ref, or a player on the field notices me, I've failed at being discrete. Even with a 400mm lens on a monopod over my shoulder.

You're a ghost with a camera. You see everything, you capture what matters, and nobody remembers you were there. That's the job.

Getting Access to Games

As a student you can get into any game. For court sports like volleyball and basketball, you can move around freely and shoot from the edges. Practice here first. You're closer to the action and don't need credentials.

Field sports are different. In Fairfax County Public Schools, you need to apply for sideline access and get approved. You'll wear credentials while shooting. The policy changes, so ask your Athletic Director for the current process. Those same credentials work at away games within FCPS.

The Unglamorous Truth

Probably the biggest thing I've learned over the years is that shooting sports is a lot of waiting around for things to happen, more bad shots than I care to admit, and the glorious, but scarce, moments of "holy shit, I nailed that shot!" Your keeper rate will slowly improve, but it will never be as high as you want. All the pros know this, even those guys on the NFL sidelines.

Fair warning: my keeper rate, the percentage of shots I actually deliver versus shots I take, is around 10%. It used to be 5%. That's not a typo. At a typical game I might shoot 800 frames and walk away with 80 usable images. The other 720 are out of focus, bad timing, blocked by a ref, wrong expression, or just not interesting. This is normal. If someone tells you they keep 50% of their sports shots, they either have very low standards or they're lying.

My experience doesn't mean I get more keepers per shutter press. It means I know where to stand, what to look for, how to read an athlete's body language, and knowing where to point the camera and when to press that shutter. The rest falls into place.

So go shoot. Shoot enough that you burn up flash cards, and then shoot some more. Recognize that walking off the field, court, or whatever with 1 perfect shot out of 1000 is actually a win. That's when you learn, and the hunt for that elusive perfect shot is why we do this.

After the Game

Everyone does it a little different, but this is my workflow: After every shoot I pull the cards from the camera and copy to my laptop. Import to Lightroom Classic, first pass is all cull. I rate into buckets: ignore, maybe, team album, Maxpreps, my IG posts. Second pass is light edits on the team shots (exposure, rotation). Heavier edits on Maxpreps and IG (crops, retouching, removing distractions). Then export and upload to SmugMug and Maxpreps.

Lightroom Classic runs about $10/month bundled with Photoshop. Adobe kind of locked up the market on this. If you know a solid free alternative, let me know.

Questions? Want hands-on help? Ask about classes and mentorship.